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NATIONAL MARINE SANCTUARIES ™

Accomplishments Report

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Under Secretary
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Assistant Administrator for
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Coastal Zone Management

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Director, Office
of Ocean & Coastal
Resource Management

Move

Whether it's the turtle who drags herself
Slowly to the sandlot, where she digs
The sandy nest she was born to dig

And lay leathery eggs in, or whether it's salmon
Rocketing upstream
Towards pools that call, *Bring your eggs here*

And nowhere else in the world,
whether it is turtle-green
Ugliness and awkwardness, or the seething
Grace and gild of silky salmon, we

Are envious, our wishes speak out right here.
Thirsty for a destiny like theirs,
an absolute right choice.

To end all choices. Is it memory,
We ask, is it a smell
They remember,

Or just what is it—some kind of blueprint
That makes them move, hot grain by grain,
Cold cascade above icy cascade,

Slipping through
Water's fingers
A hundred miles

Inland from the easy, shiny sea?
And we also—in the company
Of our tribe

Or perhaps alone, like the turtle
On her wrinkled feet with the tapping nails—
We are also going to travel, we say let's be

Oblivious to all, save
That we travel, and we say
When we reach the place we'll know

We are in the right spot, somehow, like a breath
Entering a singer's chest, that shapes itself
For the song that is to follow.

—Alicia Ostriker

"Move" is from Green Age by Alicia Suskin Ostriker, 1989.

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Photo compliments of marine photographer & cinematographer Bob Talbot

Conservation is a state of harmony between men and land —Aldo Leopold

photo: Bob Talbot

For over two decades, the Department of Commerce's National Oceanic and Atmospheric Administration's National Marine Sanctuary program fostered an ocean ethic that encourages all of us to share a commitment to protect our nation's priceless marine resources.

This ocean ethic recognizes the need for sustainable use and requires that sanctuaries take a lead role in managing and protecting marine and coastal protected areas for the benefit of this and future generations.

In 1948, conservationist Aldo Leopold wrote in *A Sand County Almanac*: "When we see land as a community to which we belong, we may begin to use it with love and respect."

Exchange the word land for ocean, and we can understand what is expected of us and how we must exchange our role of "conqueror of the [ocean] community to plain member and citizen of it."

In a number of profound ways the sanctuaries promote this ocean ethic—through research into the workings of complex ecosystems, through monitoring environmental changes over time, and through the tireless efforts of volunteers, researchers, and educators. They carry the message that oceans, just as much as our nation's land, need help and deserve our respect.

Last year the sanctuary program built partnerships with other marine advocates, forged international links among local communities and foreign countries. It reached out to people and governments from the People's Republic of China to New Zealand to Great Britain.

In 1997, sanctuary research projects examined a host of environmental issues, such as how fish and mammals respond to human and natural disturbances, and the importance of keeping coral reefs and coastal wetlands ecosystems intact through improved water quality.

Through education and volunteer programs, sanctuaries enable a new generation of marine advocates to recognize the need for balancing human and environmental needs and to promote the importance of sustainability.

The yearlong events in 1997—rock concert fund-raisers and designation celebrations, long-term plans for saving a Civil War battleship, archaeological discoveries in the Gray's Reef Sanctuary, travelling photography exhibit, and publication of a children's coloring book—all carried the message of a new ocean ethic.

Americans have long acknowledged the necessity of a Yellowstone or Glacier national park; increasingly Americans understand that protections must extend equally to our oceans. Today a growing number of citizens see national marine sanctuaries as important pieces of the larger mosaic of environmental conservation.

The threats to our oceans —pollution, habitat loss, depleted fisheries, and increased populations in coastal areas—increase with each year. In late 1997, the immense impact of the ocean on humankind captured the world's attention as one of the strongest El Niños affected weather around the globe. This and other events such as toxic algal blooms sounded an alarm that lends urgency to the United Nation's declaration of 1998 as the Year of the Ocean.

As we prepare for a new century, the sanctuary program continues to provide leadership in this growing ocean ethic of marine conservation.

Whether man is disposed to yield to nature or to oppose her,
he cannot do so without a correct understanding of her language. — *Jean Rostand*

photo: Bob Talbot

In 1997, the National Marine Sanctuary program celebrated its 25th anniversary in events held around the country. From the halls of Capitol Hill to the shores of Monterey Bay, the sanctuaries showcased their long history of coastal stewardship and marine sustainability and outlined their goals for the 21st century.

The celebrations provided Americans with a more comprehensive view into the workings of a program dedicated to protecting vulnerable marine ecosystems and the wealth they share: food, recreation, energy, medicine, commerce, and aesthetic values such as wonder, mystery, and inspiration.

The 25th anniversary also showcased the many sanctuaries educational projects and programs.

These programs teach students of all ages the many aspects of the marine world and strengthens a growing ocean ethnic. This ethic takes to heart Rachel Carson's warning that empty skies may someday well apply to the world's seas and recognizes that individuals can make a difference in conserving fragile marine resources.

The marine sanctuaries used 1997 to salute both long-established and new partnerships with others equally concerned about the fate of our oceans. "A Big Time with *Little Texas*," a boot-scootin' benefit concert, united the National Marine Sanctuary program, the country western band *Little Texas*, the diving industry, the Gulf of Mexico Foundation's Flower Garden Fund, Warner Brothers, Reef Environmental Education Foundation (REEF) and Houston's Seaspace in a musical celebration.

The cooperative effort raised awareness of the fragility of our oceans during the International Year of the Reef and raised some $63,000 for research and education at the Flower Garden Banks Sanctuary.

The Great American Fish Count, an event much like Audubon Society's annual Christmas Bird Count, went national in 1997. During two weeks in July, divers and snorkelers took to sanctuary waters with pen and pad to log in the numbers. Sanctuary partners organized a score of volunteers who documented fish diversity and population and helped the American Oceans Campaign, REEF, Marine Conservation Network, scientists, and sanctuary managers gauge the health of the oceans.

Within this annual accomplishment report, "Sanctuary Sea Stars"—the many special individuals who keep the sanctuaries going and growing—are recognized and applauded for their dedication to our nation's coasts and oceans.

In looking for ways to further public awareness and understanding of the marine sanctuaries, this report concludes with "Sea Smarts," a section highlighting just a small number of our many partners in marine conservation, and their suggestions on ways each of us can help protect the world's marine resources.

Today, marine sanctuaries are places in the sea,
as elusive as a sea breeze,
as tangible as a singing whale.

They are beautiful, or priceless,
or rare bargains,
or long-term assets, or fun,
or all of these and more.—Dr. Sylvia Earle

photo: Bob Talbot

The National Marine Sanctuary program's anniversary year brought a sea change in strategy. As the program moved from designation to operations, it emphasized a new stand on global leadership in marine protected areas.

In February, after seven years of local debate and deliberation, Governor Lawton Chiles and his cabinet signed the law that brought Florida state waters into the Florida Keys National Marine Sanctuary. In June 1997, Governor Benjamin Cayetano approved the final designation of the Hawaiian Islands Humpback Whale National Marine Sanctuary, protecting the winter breeding home of the largest Pacific population of the endangered humpback whales.

These designations illustrate the sanctuary program's approach to managing public marine resources based on open community dialogue and participation. Diverse communities, sometimes with conflicting voices, join in fashioning sanctuaries that combine marine and coastal stewardship with individual economic and recreational goals. Both sites harness the energy of individuals and advisory councils, and today after the formal designations still receive active participation from local residents.

Recent sanctuary research provided significant data to the global scientific community. Gray's Reef Sanctuary works with the U.S. Fish and Wildlife Service and the state's Department of Natural Resources to study endangered loggerhead sea turtles off Georgia. By affixing satellite transmitters to the turtle's backs, sanctuary staff can trace their movements via the Internet (*www.whalenet.wheelock.edu*).

In the Channel Islands Sanctuary, the Whale Habitat and Prey Study (WHAPS) researched an unusually high concentration of blue whales. The study, led by NOAA's fisheries service, and Scripps Institute of Oceanography, examines distribution of whale activity and its main prey—krill.

Today over 100 Gulf of the Farallones Sanctuary Beach Watch volunteers patrol "their beaches." Theirs are the first eyes in identifying and photo-documenting marine life and human activity and in guiding visitors away from seal pup breeding areas to safer lookout points.

Across the country in the Florida Keys, volunteers offer on-the-water education and information to the millions of visitors to the state's precious coral reefs.

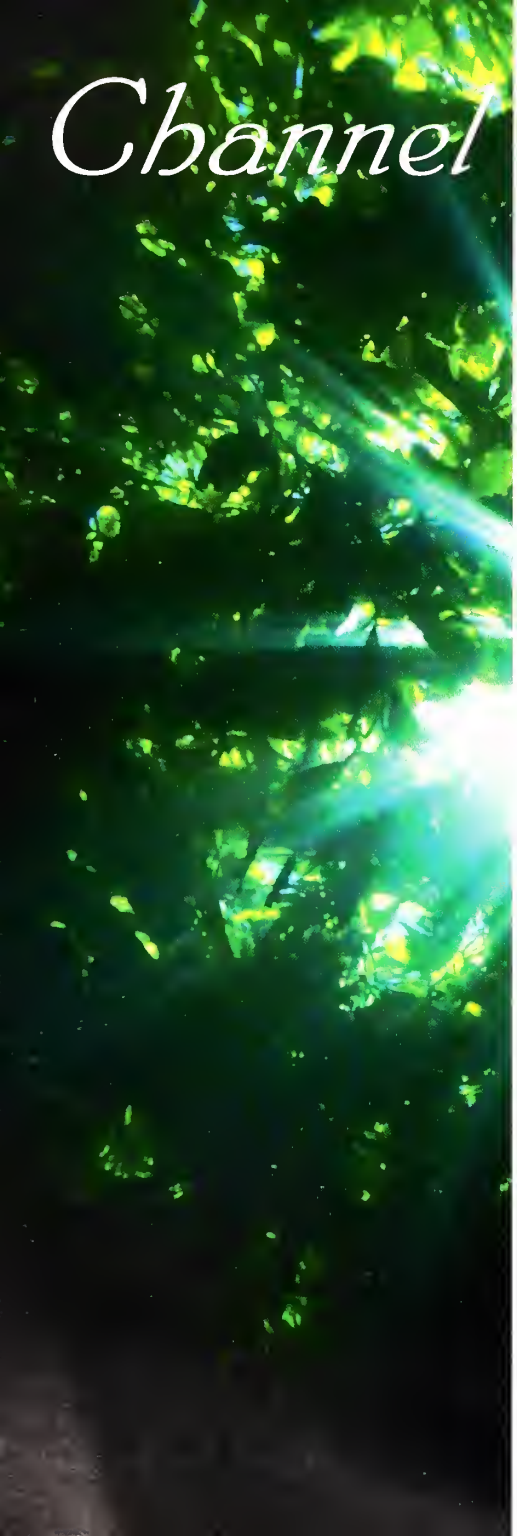
The sanctuaries received national media attention late in the year. National Public Radio "Radio Expedition" took 1.5 million listeners on a trip to the national marine sanctuaries. This was followed by a *National Geographic* article on the sanctuaries that reached over 9.9 million readers.

While 1997 was a year of greater public awareness for the marine sanctuaries, the program remains relatively small, with a growing mission to manage 12 diverse marine and coastal areas.

This is no small task, and the program cannot do it alone. Partnerships, volunteers, and community involvement make the sanctuaries successful. They help us promote a new ocean ethic that reminds us that our oceans are not limitless, and concern, care, and action are what is needed from all of us.

On the following pages, the 12 sanctuaries review their national and international accomplishments of the past year.

In "Sea Smarts," our marine partners show us ways we can protect the oceans and coasts we all share and enjoy.



Channel Islands NMS

First Squid Symposium Held

As squid markets collapsed in waters around the world, fishing boats descended on the Channel Islands Sanctuary. Last year 90,000 metric tons of squids were taken; no one is sure how much is too much, and how great the effect may be on the larger food chain in the Channel Islands.

To address the potential impacts on the marine ecosystem by the squid harvesting, the sanctuary and the California Seafood Council cosponsored a special squid symposium as part of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) conference. The California Department of Fish and Game, squid experts, and fishery regulators from around the world presented papers. The sanctuary expanded the symposium to include an ecosystem perspective for managing squid, including papers on the foraging behavior of seabirds and on long-term variability in squid, sardine and anchovy stocks in the California Current. The symposium closed with a panel discussion on ecosystem management.

Sanctuary staff drew upon a diverse group of speakers for the panel—squid fishermen and light boat operators, ecosystem management experts, a seabird expert, and an oceanographer. The sanctuary plans to publish panel discussions as an addendum to the CalCOFI proceedings in Fall 1998.

Seeing the Bigger Picture

In July, the sanctuary's long-awaited Aerial Survey Program began operations with the Channel Islands and Monterey Bay sanctuaries sharing use of a NOAA research aircraft.

The aircraft monitors activities and resources, surveys sanctuary users and any oil spill emergencies,

conducts vessel traffic studies, and observes the effects of shore run-off. It also collects data on both marine mammals and kelp forests and records sightings via photography and video.

Special onboard equipment includes a Global Positioning System and laptop computer. After each flight, position information is downloaded to a Geographic Information System (GIS) to register the location of objects in sanctuary waters.

The four-passenger sea plane's engine is mounted above the pilot and passengers, enabling the plane to land on its hull if necessary. Projects in 1997 included vessel and marine mammal surveys and kelp mapping, Monterey Bay vessel traffic survey, NOAA ship *McArthur* blue whale study, and offshore oil platform *Irene* oil spill response.

New Alliance for Education

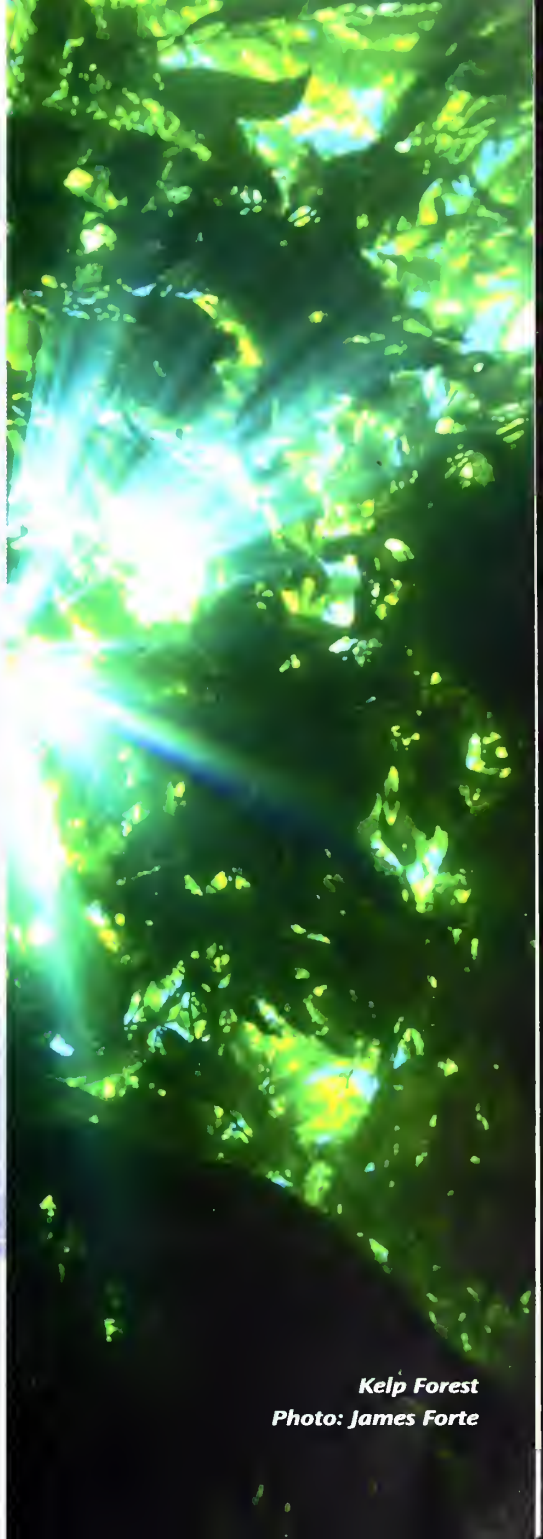
The Marine Educators' Regional

International Links

In 1997, the Channel Islands Sanctuary, the Environmental Defense Fund, and Patagonia hosted Dr. Bill Ballantine, marine biologist, grassroots activist, and recipient of the prestigious Ronald and Rhoda Goldman Environmental Award.

During his visit, Dr. Ballantine shared his experiences in establishing no-take marine reserves worldwide. No-take marine reserves—where fishing and all collecting is banned—maintain the natural processes of the sea, protect biodiversity and ecological functions, and ultimately coastal economies. His efforts helped establish New Zealand's first marine reserve in 1981, and 12 additional reserves in subsequent years.

Following Dr. Ballentine's visit, the Channel Islands sanctuary staff joined with local fishermen, whose livelihood depends on the resources within the sanctuary, to explore the concept of "no-take zones" and to look for ways to continue future discussions.



Kelp Forest
Photo: James Forte

Alliance (MERA) celebrated its first anniversary in 1997, an event coordinated by the sanctuary.

MERA, composed of 28 area organizations, was established by the sanctuary in Spring 1996 with a mission of enhancing marine education and encouraging marine stewardship. MERA's anniversary coincided with the California Coastal Commission's 13th Annual Coastal Cleanup Day. MERA members joined hundreds of community volunteers in cleaning beaches, rivers and lakes, while divers picked up trash from the sea floor. Sanctuary staff alone removed over 150 pounds of debris. At a press conference that day, MERA announced that its First Annual Award for outstanding contributions in marine education would be awarded in 1998.

Channel Islands National Marine Sanctuary extends its special thanks to each member of MERA for his or her collaborative hard work and dedication.

Stars of the Sea

Anne Walton, a University of Washington Marine Policy graduate, volunteered hundreds of hours this year to work with Channel Islands Sanctuary staff in developing a Marine Watch curriculum and training program that will be implemented in 1998.

This new program draws upon methods used in other marine sanctuaries, enlists volunteers to educate recreational groups, and promotes ecologically sustainable use of natural resources.

Marine Watch volunteers will soon be raising public awareness of sanctuary regulations, sharing knowledge about marine and cultural resources, and emphasizing the importance of preventing damage to the marine habitat while enjoying it. As sanctuary stewards, they will also gather information on marine mammal sightings and marine pollution and distribute educational materials to the many sanctuary visitors.

Habitats

Kelp forests

Rocky intertidal

Sandy beaches

Seagrass meadows

Pelagic, open ocean

Deep rocky reefs

Key Species

California sea lion

Elephant & harbor seals

Blue, humpback & gray whales

Dolphins

Blue shark

Brown pelican

Western gull & Ashy Storm petrel

Rockfish

Market squid

Abalone & sea urchin

Black sea bass

Channel Islands National Marine Sanctuary

encompasses the waters surrounding San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara Islands. A fertile combination of warm and cool currents results in a great variety of plants and animals, including large nearshore forests of giant kelp, flourishing populations of fish and invertebrates, and abundant and diverse populations of cetaceans, pinnipeds, and marine birds.

Research Activities

The sanctuary supports oceanographic, seabird, marine mammal, kelp forest, and intertidal research by local, state, and federal agencies. Part of its on-site assistance for regional research projects includes the 56-foot research vessel, *Ballena*. Today the sanctuary holds a research bibliography with over 4,000 scientific references, cosponsors research symposia, and provides a Geographic Information System database for the research community.

Education Activities

Interpretive exhibits, signs and displays, programs and curriculum for teachers and students are part of the Channel Islands Sanctuary educational activities. The Sea Center, a marine aquarium and educational facility, and Los Marineros, a marine science program for fifth graders are managed through a cooperative agreement with the Santa Barbara Museum of Natural History. Sanctuary publications include newsletters, brochures, posters, and educational resource directory. Throughout the year, the sanctuary offers public programs, lectures, and events. Its internship and volunteer programs are an important part of sanctuary operations.

Location

About 25 miles off the coast of Santa Barbara, California

Protected Area

1,658-square miles

Designation

September 1980

Address

113 Harbor Way
Santa Barbara, CA 93109

Communication

Tel: (805) 966-7107
Fax: (805) 568-1582

E-mail: channel_islands@ocean.nos.noaa.gov

Web Page: www.cinms.nos.noaa.gov

Cordell Bank NMS

Studying Krill, Understanding Whales

A sanctuary research cruise, completed in 1997, investigated the distribution and abundance of krill in waters over and adjacent to Cordell Bank. As a part of this study, the sanctuary was able to document the importance of Cordell Bank as a summer destination feeding ground for blue and humpback whales. Each summer these great whales arrive at Cordell Bank after travelling from Hawaiian and Mexican breeding areas to feed on the huge schools of krill present around the Bank.

In conjunction with collecting the biological data, sanctuary staff measured the physical characteristics of the ocean to determine environmental influences on the distribution of prey and predator.

Researchers used instruments to measure salinity, temperature, currents, primary productivity, light penetration into water columns and other variables at depths from surface to bottom to construct a profile of the water column. This information helps the sanctuary to better understand current structure, eddy formations, and retention of areas in our coastal ocean.

Sanctuary staff combine the physical data with the biological information to better understand the processes that are driving the incredible productivity associated with Cordell Bank. This annual cycle of productivity starts with an influx of nutrients from spring upwelling and fuels growth at all levels of the marine food web.

The sanctuary plans to continue ongoing research on this productivity in the Cordell Bank in order to detect annual and seasonal variability and long-term trends.

Seabirds of Cordell Bank

Cordell Bank is a feeding mecca for open ocean seabirds drawn to the Bank by the abundance of available food. More species of

albatross have been seen at Cordell Bank than anywhere else in the Northern Hemisphere.

The Cordell Bank National Marine Sanctuary completed a field guide for the seabirds of Cordell Bank. The guide provides a complete listing of species observed with natural history and seasonal distribution information for each species. The field guide is equally useful for new and accomplished birders as well.

On the Trails, On the Road

During 1997 the sanctuary developed and installed wayside interpretive displays. These displays present information about the sanctuary program along with boundary maps and natural history information for some distinctive sanctuary animals at coastal overlooks in Point Reyes National Seashore, Golden Gate National Park, and the Army Corps of Engineers Bay Model. These tourist areas are visited by over two million

International Links

A Chinese delegation recently toured the sanctuary and discussed the unique management issues associated with Cordell Bank. The delegation explored a variety of questions with the sanctuary staff: how does the sanctuary manage these protected areas, what do our regulatory policies entail, and how is water quality affected by human impacts. The delegation expressed hopes that the information gathered will aid in establishing marine protected areas in China, using the marine sanctuary program as a model.

Also in 1997, the sanctuary hosted Russian fishermen for a discussion on how different gear types affect hard bottom habitats. The sanctuary emphasized the importance of rocky substrates as refugia for early life stages of many commercially important species especially juvenile fishes. The fishermen came away with a greater awareness of how habitat is critical to the continuance of healthy stocks of fish.

Juvenile Rockfish
Photo: Cordell Bank Expeditions

visitors each year.

The Whale Bus, a travelling exhibit that teaches schools and community groups about marine mammals and their environment, continued to receive support from the sanctuary. The Whale Bus project emphasizes sanctuary goals as well as educates people about the biology and habitat required to maintain healthy populations of sea otters, dolphins, seals, and whales. During last year, some 40,000 people heard the sanctuary message through visits from the Whale Bus.

Also in 1997, Cordell Bank Sanctuary hosted a public open house on the NOAA vessel *McArthur,* berthed at Pier 45 in San Francisco. The event highlighted research activities and findings from the sanctuary cruise. Posters, sampling equipment, and microscopes were set up to allow the public attending to learn more about the cruise, the NOAA Corps, and the sanctuary program.

Stars of the Sea

Rich Stallcup, an internationally recognized birder, is one of the premier field ornithologists in North America and an important contributor to the sanctuary. Rich has published a multitude of articles stemming from his keen wildlife observations, conservation ethic, and his love for teaching. One of the early founders of the Point Reyes Bird Observatory in 1965, Rich has led countless birding trips, many of these into the open ocean habitat around Cordell Bank. He's documented seasonal and annual occurrences of seabirds around Cordell for over 20 years and recently completed a field guide of Cordell Bank. Stallcup is responsible for naming the Bank as the "albatross capital - top half of the world" (Northern Hemisphere).

Rich continues to lead many sanctuary field outings including natural history boat trips to Cordell Bank and field training classes for the Sanctuary Beach Watch program. In addition to his birding sense, Rich is an enthusiastic teacher, providing information on behavior, population dynamics, physiology, and ecology of the different species. Through his many efforts, Rich has heightened awareness and increased appreciation for Cordell Bank as a vital habitat for many marine species in the eastern Pacific.

Habitats

Rocky subtidal

Seamount

Pelagic, open ocean

Soft sediment continental shelf and slope

Key Species

Krill

Pacific salmon

Rockfish

Humpback whale

Blue whale

Dall's porpoise

Albatross

Shearwater

Cordell Bank National Marine Sanctuary

contains the most productive offshore seamount on the west coast, where the combination of ocean conditions and undersea topography creates a highly diverse marine community. The Bank rises to within 115 feet of the sea surface with water depths of 6,000 feet only a few miles away. The prevailing California Current flows southward along the coast, and the upwelling of nutrient-rich, deep ocean waters stimulates the growth of organisms at all levels of the marine food web. It is a destination feeding ground for many marine mammals and seabirds.

Research Activities

Scientists affiliated with Cordell Bank Sanctuary carry out research projects investigating this unique marine ecosystem. An ongoing integrated study examines the relationship between oceanographic conditions and the distribution and abundance of marine organisms from phytoplankton to marine birds to the great whales. Special studies focus on daily migrations and distribution of krill, the primary food for many predators. Other studies include pelagic surveys and phytoplankton sampling for the state biotoxin monitoring program.

Education Activities

Educational efforts include teaching materials on deep ocean ecology and pelagic ecosystems and teacher workshops and training classes to advance the understanding of our marine environment. Interpretive displays at several prominent visitor areas along the coast, interactive exhibits in aquariums and education centers, fields excursions, and community presentations inform the public about the sanctuary's role in preserving the marine environment.

Location
60 miles northwest of San Francisco

Protected Area
526-square miles

Designation
May 1989

Address
Fort Mason
Building #201
San Francisco, CA
94123

Communication
Tel: (415) 561-6622
Fax: (415) 561-6616

E-mail: cbnms@ocean.nos.noaa.gov

Web Page:www.nos.noaa.gov/ocrm/nmsp/mscordellbank.html

Fagetele Bay NMS

Celebrating the Year of the Reef

The Fagatale Bay National Marine Sanctuary was the lead agency in the International Year of the Reef activities in American Samoa.

The sanctuary invited researchers and recreational divers from around the world to carry out surveys of the pristine reefs. Strict protocols were demanded for the surveys and each survey team submitted its data to a central collection point in Hong Kong for analysis and dissemination. The Samoan survey team, composed of members from the sanctuary, the Department of Marine and Wildlife Resources, the American Samoa Coastal Management Program, and the American Samoa Community College chose Amalau Bay in the National Park of American Samoa as its pristine site. Data indicated that even this "pristine" site bore evidence of human impacts.

Sanctuary staff carried out a yearlong celebration starting with a proclamation from the governor and a kickoff ceremony featuring awards to the winner of a logo and slogan contest. Local artist Siuleo Pouesi created the logo design—a fish encircling a coral head—and the slogan *Ofaga o le Moana* or "ocean-home."

Over 2,000 students took part in activities spearheaded by the sanctuary in 1997. One school program run by sanctuary staff at the national park visitor center reached over 500 students.

In addition, the sanctuary carried the message of marine protection in monthly newspaper columns about coral reef issues.

New Partners, Better Protection

In 1997 the sanctuary entered into a new enforcement partnership with Samoa's marine patrol. With this cooperative agreement with the Department of Public Safety's

Marine Patrol, vulnerable ecosystems and species gained greater protection. Prior to this agreement, the sanctuary had received no routine enforcement. In just six months, over 60 patrols were conducted at the site.

Also in 1997, the sanctuary launched its village outreach program in cooperation with the environmental educators group *Le Tausagi*, of which the sanctuary is a founding member. Sanctuary Education Coordinator Punipuao Lagai-Nagalapadi and two Americorps volunteers, Christianera Tuitele and Cathy Faoa joined with the other *Le Tausagi* members to create a theatrical presentation using skits and songs about environmental issues. They conveyed their message in an entertaining format that the community loved.

The National Park of American Samoa collaborated with the sanctuary's annual Marine Science Summer Camp in the National Park

International Links

The Fagatale Bay National Marine Sanctuary, as the lead agency in the region for the Pacific's International Year of the Reef, worked closely with the South Pacific Regional Environmental Programme (SPREP). A grant from SPREP, which is headquartered in Apia, Western Samoa, enabled the sanctuary to fund new projects including the Year of the Reef kickoff celebration and the logo and slogan contest.

Sanctuary Coordinator Nancy Daschbach represented the Territory of American Samoa at the SPREP-sponsored International Conference on Nature Conservation and Protected Areas held in Pohnpei, Federated States of Micronesia. At the conference, Ms. Daschbach presented a paper entitled "Maximizing Resources for Marine Management: the Fagatale Bay NMS Experience."

Tropical Coral Reef
Photo: Linda Wade

Discovery Tour. Along with sanctuary and park staff, 12 students visited Ofu, Manu'a, one of the outer islands, to snorkel and visit archaeological sites. For most of the students, it was their first trip to the island group that is considered to be the "birthplace of Samoa."

In cooperation with the Hawaiian Islands Humpback Whale Sanctuary and the University of Hawaii Sea Grant Pacific Program, the sanctuary produced a coral reef coloring book that it distributed to every middle school student in the territory. The 40-page book features text in Samoan, Hawaiian, and English as part of a school outreach program highlighting coral reef issues and, in 1998, Year of the Ocean issues.

Stars of the Sea

Americorp volunteers Cathy Faoa, 24, and Christianera Tuitele, 23, contributed much to the Fagatale Bay National Marine Sanctuary in 1997. As part of the education staff, the two women wrote several humorous skits that delivered a serious message of marine protection. Faoa and Tuitele's skits and original songs, adopted the Samoan style of storytelling—faleaitu —that uses humor to deliver a moral message.

Faoa and Tuitele join other Samoan environmental educators in "Le Tausagi," which literally means the "morning call of the birds." This group takes to the public a coordinated environmental message that incorporates themes from the various government agencies. Founded by Fagatale Bay Sanctuary Education Coordinator Punipuao Lagai-Nagalapadi, Le Tausagi has succeeded in presenting a unified environmental voice in the local community.

Habitats

Tropical Indo-Pacific coral reef

Key Species

Crown-of-thorns starfish

Blacktip reef shark

Surgeon fish

Hawksbill turtle

Parrotfish

Giant clam

Fagatele Bay National Marine Sanctuary

houses a fringing coral reef ecosystem contained within an eroded volcanic crater on the island of Tutuila. Nearly 200 species of coral are recovering from a devastating crown-of-thorns starfish attack in the late 1970s, which destroyed over 90% of the corals. Since then, new growth has been compromised by two hurricanes, several tropical storms, and coral bleaching. This cycle of growth and destruction is common in tropical marine ecosystems.

Research Activities

Coral reef habitat survey, temperature and water quality monitoring programs, and long-term resource recovery survey make up the bulk of the sanctuary's research efforts.

Education Activities

Throughout the year, Fagatele Bay Sanctuary works to involve the community in its many activities. A ninth-grade marine science camp, Enviro-Discoveries camp for younger students, and a school and village outreach program are a few popular sanctuary endeavors. In addition to its educational programs, posters, brochures, and coloring books to celebrate the Year of the Turtle (1996) and the Year of the Coral Reef (1997) have also been created by the sanctuary.

Location
The southwest shore of Tutuila Island, American Samoa, 14 degrees south of the equator

Protected Area
0.25-square miles

Designation
April 1986

Address
P.O. Box 4318
Pago Pago, American Samoa 96799

Communication
Tel: (684) 633-7354
Fax: (684) 633-7355

E-mail: ndaschbach@ocean.nos.noaa.gov

Web Page: www.nos.noaa.gov/nmsp/FBNMS/

Florida Keys NMS

A "True Partnership"

After a long and deliberate designation process, the final regulations that govern the Florida Keys National Marine Sanctuary went into effect in July 1997. Governor Lawton Chiles and his Trustees unanimously voted in support of the new sanctuary, citing the designation as a "true partnership" between the state of Florida and the National Oceanic and Atmospheric Administration.

Throughout the six-year period of planning and public discussion, the state, NOAA, and a diverse local community searched for ways to protect the fragile marine resources while preserving the unique lifestyle and quality-of-life associated with the Florida Keys.

Today the Florida Keys National Marine Sanctuary protects and preserves America's only living barrier coral reef, vast seagrass meadows, mangrove fringed islands, and the rich marine life these marine communities support.

Protecting Tortugas Bank

After learning that large freighters had caused massive coral damage within sanctuary waters, the sanctuary invoked its first-ever emergency rule and stopped anchoring by large ships in the Tortugas Bank coral beds.

The damage was first documented in August 1997 by a dive-boat crew who came upon the scene. A videotape taken by the crew showed scenes of coral gouged by the freighters' huge anchors and chains.

Under the emergency regulations ships continue to travel through the area, but they must use other anchoring sites. The emergency rule remained in place for 120 days; a permanent rule is planned in 1998.

The ability to quickly respond to the coral destruction was a direct

result of the designation approval by the state. Especially heartening to the sanctuary was public support of this first emergency rule.

Divers Making a Difference

In 1997 the Florida Keys Sanctuary's participation in the International Year of the Reef Coral Reef Check marked an important step forward in increasing its knowledge of vulnerable coral reefs and promoting the importance of research and conservation in affected reefs.

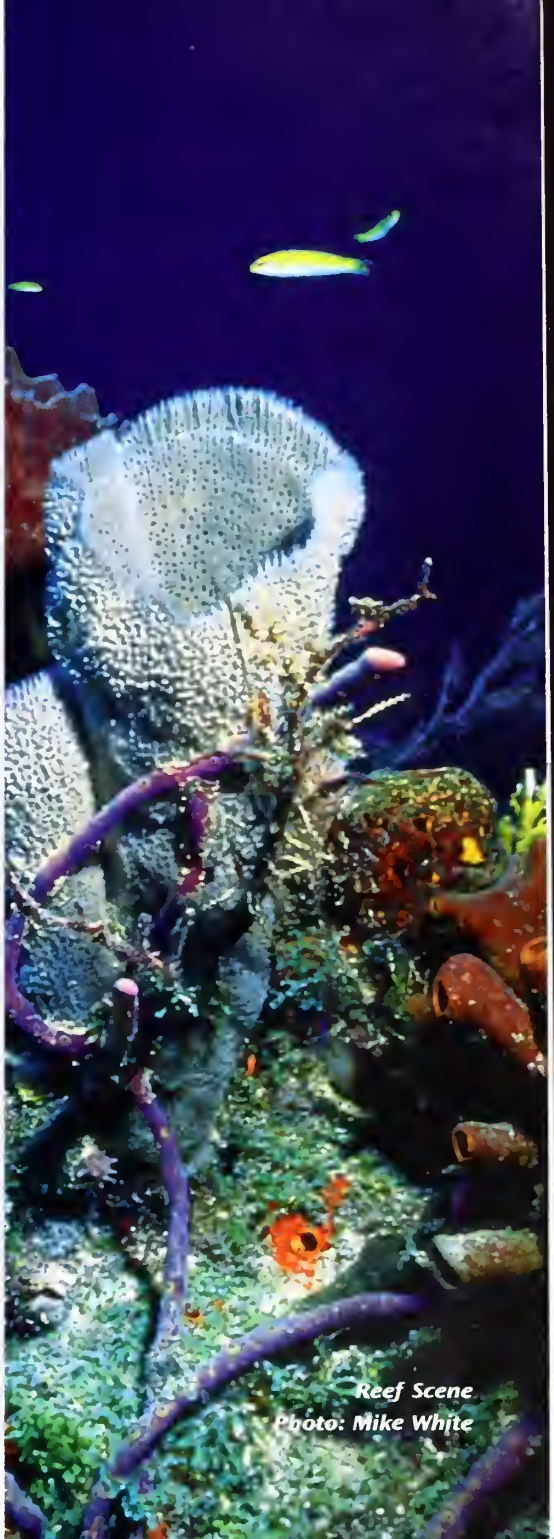
During Reef Check, divers studied 23 reefs that totaled the size of seven football fields. Joining with partners from The Nature Conservancy, ReefKeeper International, and the Reef Environmental Education Foundation, the sanctuary's survey of coral reefs provides important scientific data to a data scarce area of marine resources.

In June and August of last year, 63 volunteer scuba divers took a closer look at the human impacts on

International Links

The Florida Keys National Marine Sanctuary has hosted several delegations of Chinese guests who toured the sanctuary and received information on the sanctuary's education, research, restoration, volunteer, and enforcement programs. Staff shared with them the many successes the sanctuary has had in dealing with complex issues in an area where the economy and environment are so closely linked.

In May 1997, Sanctuary Superintendent Billy Causey was part of a NOAA delegation that visited the People's Republic of China to exchange information on coastal zone management issues, as well as issues regarding marine protected areas. A number of unprecedented joint projects were identified by the Chinese and US delegates, including the establishment of a sister coral reef sanctuary relationship in Sanya, China. The sister sanctuary agreement was signed in May 1998.



Reef Scene
Photo: Mike White

coral—anchor damage, disease, and sewage pollution. Organized by Hong Kong's Institute for Environmental and Sustainable Development, the survey brought together 100 marine scientists and 750 recreational divers who surveyed 300 coral reefs in 30 countries and territories.

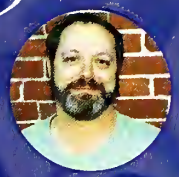
The divers collected data about the health of the vulnerable coral ecosystems, counted fish and noted trash and fishing lines.

The survey's preliminary results from 230 sites revealed, "a clear pattern of global damage to coral reefs, particularly due to overfishing and destructive fishing." But the report for Florida reefs is more positive.

Ben Haskell, sanctuary program specialist, states that although Reef Check '97 found the status of lobster populations worldwide to be "dismal," (none were recorded in 81% of the reefs surveyed).

"Florida Key reefs were much better off than the rest of the world," Haskell said.

Stars of the Sea



Save Our Keys was an integral link between sanctuary staff, the public, and state government. This group of dedicated individuals believed in the preservation and conservation of the marine resources that make up the sanctuary and worked hard to see that the management plan was implemented.

Save Our Keys was initially founded to educate citizens about the importance of the sanctuary during a 1996 county-wide referendum. The committee grew out of Sanctuary Friends of the Florida Keys, an earlier grassroots organization that coordinated support during hearings on the sanctuary's draft management plan. Environmental activists included David Holtz (pictured above), Karen Lee, Jim Hurley, Frank Hawkins and Cheva Heck as campaign director. Many other Keys residents signed on as steering committee members, acting as "goodwill ambassadors" for the sanctuary among their neighbors and colleagues.

Habitats

Coral reefs

Patch & bank reefs

Mangrove-fringed shorelines & islands

Sand flats

Seagrass meadows

Key Species

Brain & star coral

Sea fan

Loggerhead sea turtle

Sponge

Turtle grass

Angelfish

Spiny lobster

Stone crab

Grouper

Tarpon

Florida Keys National Marine Sanctuary

supports one of the most diverse assemblages of underwater plants and animals in North America. Although best known for its coral reefs, the shallow waters near the shore are composed of interconnecting and interdependent natural habitats such as fringing mangroves, seagrass meadows, hardbottom regions, patch reefs, and bank reefs. This complex marine ecosystem forms the foundation of the commercial fishing and tourism-based economies so important to Florida.

Research Activities

Within the 3,674-square mile sanctuary, scientists conduct a wide array of research activities. In coordination with the Environmental Protection Agency and the state of Florida, the Florida Keys Sanctuary monitors ecosystem health. Currently, the sanctuary is closely monitoring successes in the precedent setting "no take" zones. A sanctuary-wide, multidisciplinary cruise assesses the current status of coral habitat. Throughout the year on-site assistance for regional university research projects takes place. Staff also maintains a Geographic Information System (GIS) on the marine environment.

Education Activities

The Florida Keys Sanctuary increases community education through television, radio, and print media. Training workshops and school programs such as the Coral Reef Classroom combine classroom and field activities for eighth graders and promote the sanctuary's mission of marine preservation. On-site interpretive tours and volunteer programs such as Team OCEAN expanded community involvement by bringing in more than 22,000 hours of volunteer help annually.

Location

The waters surrounding the archipelago formed by the Florida Keys

Protected Area

3,674-square miles

Designation

November 1990
Approved July 1997

Address

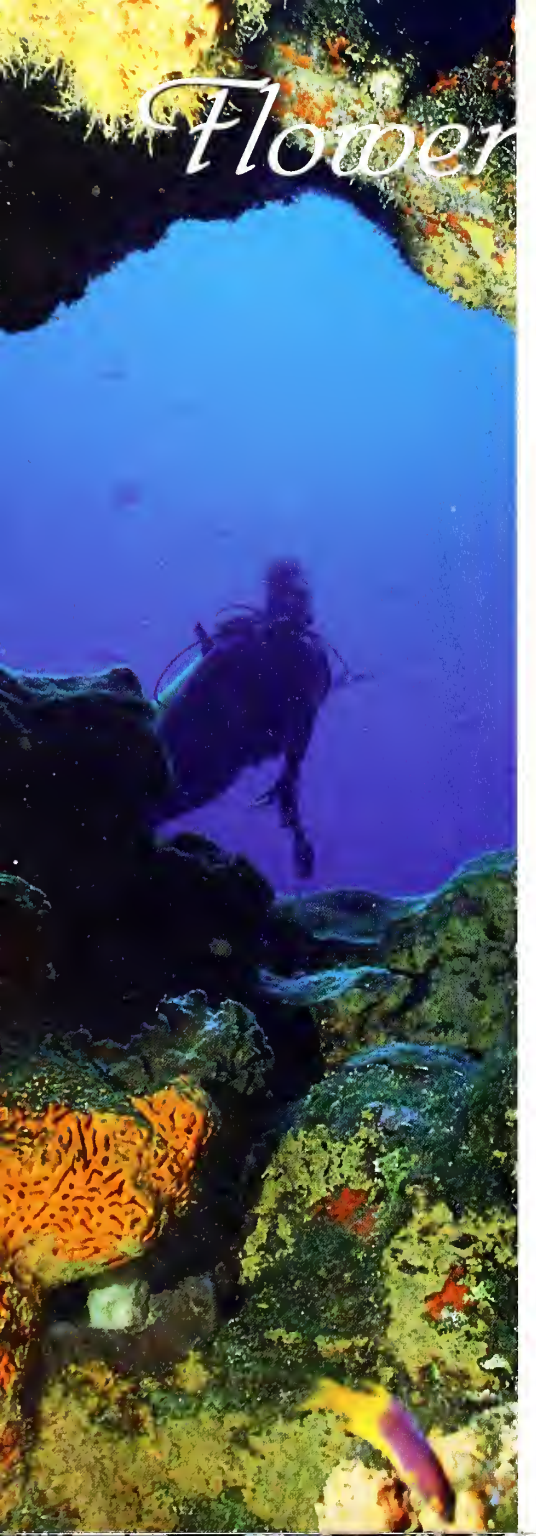
P.O. Box 500368
Marathon, FL 33050

Communication

Tel: (305) 743-2437
Fax: (305) 743-2357

E-mail: fknms@ocean.nos.noaa.gov

Web Page: nos.noaa.gov/nmsp/fknms/



Flower Garden Banks NMS

Big Time with Little Texas

In 1997, "A Big Time With Little Texas" benefit concert raised over $63,000 for research and education at the Flower Garden Banks Sanctuary. Corporate and private donors joined with *Little Texas*, a country rock band and sanctuary supporter, who performed the concert at the Houston Seaspace, an annual major diving show.

The successful fundraiser resulted from the efforts of the marine sanctuary, a major record label, and three environmental nonprofit organizations—the Gulf of Mexico Foundation's Flower Gardens Fund, Seaspace, and Reef Environmental Education Foundation. Proceeds were divided among the nonprofits for research and education projects at the sanctuary.

Teaching the Teachers

The Gulf of Mexico Foundation's Flower Gardens Fund and Shell Oil Foundation made it possible for 18 educators from across the nation to visit the Flower Gardens in the second "Down Under, Out Yonder" teachers workshop. To promote a multi-disciplinary approach to sanctuary education, participants came from all subject areas, and included classroom teachers and informal educators.

Participants heard lectures on coral reef ecology, reef fish identification, research and management of the sanctuary, oil and gas exploration in the Gulf of Mexico, and biological productivity on artificial reefs. Experts from the government, academia, private nonprofits, and industry presented the daily lectures.

Following the lectures, participants

next spent two days diving in the sanctuary. Between dives, researchers and industry experts reviewed the lecture material and helped participants hone their fish identification skills. Fish surveys conducted by the educators were included in a national database of fish species, available on the Internet at *www.reef.org*.

In a separate venture, the sanctuary teamed with NOAA's "Teacher at Sea" program and hosted two teachers on a research cruise. The teachers observed researchers and assisted with various tasks such as dissecting fish for genetic analysis and examining Sargassum (floating algae). As a result of their research, they are better prepared to teach children about the sanctuary's marine resources.

Great American Fish Counts

The sanctuary hosted organizers of the Great American Fish Count during a four-day training cruise in

International Links

The Flower Garden Banks Sanctuary's mission to promote marine stewardship reached a global audience in 1997 when sanctuary staff presented papers at the International Coral Reef Symposium. One paper, authored by Sanctuary Manager Steve Gittings, C.V. Pattengill and B.X. Semmens, looks at reef fish structure at the Flower Gardens and Stetson Bank in the Gulf of Mexico. In "Regulation by reason: science and management in the Flower Gardens Sanctuary, NW Gulf of Mexico," Gittings, C.L. Ostrom and K.J.P. Deslarzes discuss the impact of the oil industry on the northwest Gulf of Mexico and management at the sanctuary. The authors emphasize the importance of using sound scientific research and monitoring upon which to base sanctuary resource management decisions related to the oil and gas industry. Papers such as these have prompted representatives from Mexico, the Bahamas, and England to use the Flower Gardens as one example of how marine protected areas can successfully coexist with the oil and gas industries.

Diver Explores Coral Formation
Photo: Jackie Reed

June. Participants learned the methodologies to instruct volunteers in fish identification, and then visited the sanctuary to conduct fish surveys.

Organizers conducted fish identification classes in several Texas cities to train volunteers to conduct surveys. Additional surveys were conducted during the year by REEF and researcher Christy Pattengill.

Altogether, 854 surveys were conducted in 1997 by over 50 volunteer and scientific divers. Nine species were recorded for the first time at the Flower Gardens.

One commercially valuable species, the yellowtail snapper, was spotted. It appears to have migrated to the area by "island hopping" along gas and oil platforms. This information is useful for resource managers because, in addition to potentially altering the ecological balance of the reef, its appearance may require increased interaction between sanctuary personnel and the commercial fishing industry.

Stars of the Sea

In 1997 BP Exploration was the major sponsor of the successful Flower Garden Banks National Marine Sanctuary benefit concert performed by the country rock band, Little Texas, which raised over $63,000 for marine science scholarships. BP Exploration has been a long-standing partner in ocean science programs in the Gulf of Mexico. As a member of the Flower Gardens Ocean Research Program, BP supports an innovative "Platforms for Research Program" providing logistics support, room and board, lab space, and other support to offshore research projects. BP Exploration supported projects such as fisheries and artificial reef ecology by Texas A&M University, Corpus Christi; migratory bird ecology by Louisiana State University; and sperm whale biology and behavior by National Geographic and Texas A&M University, Galveston. In a recent project, graduate students from Texas A&M study artificial reef productivity in the Gulf, examine the life forms living on the legs of the platforms and compare them to the natural reefs in the Flower Garden Banks Sanctuary.

Habitats

Coral reefs

Algal-sponge communities

Brine seep

Sand flats

Pelagic, open ocean

Artificial reef

Key Species

Star coral

Brain coral

Manta ray

Hammerhead shark

Loggerhead sea turtle

Flower Garden Banks National Marine Sanctuary

lies 110 miles off the coasts of Texas and Louisiana where three underwater gardens emerge from the depths of the Gulf of Mexico like oases in the desert. The Flower Gardens and Stetson banks are surface expressions of salt domes beneath the sea floor. These premier diving destinations harbor the northernmost coral reefs in the United States and serve as regional reservoirs of shallow-water Caribbean reef fishes and invertebrates.

Research Activities

Research and monitoring activities are designed to provide crucial information of special ecosystems within the sanctuary. Sanctuary staff actively pursue cooperative partnerships with universities, non-profit organizations, industry, and other government agencies. In addition to annual monitoring of general reef health, research activities currently include: population census and behavioral studies on fish, turtles, sharks, and rays; satellite tracking of sea turtles; mass coral spawning; genetic studies on fish, turtles, and corals; paleoclimatology; and coral diseases.

Education Activities

Four major target audiences—recreational divers, oil and gas industry, teachers, and students—are identified as high priority for the sanctuary's education and outreach efforts because of their potential to impact the continued health of sanctuary natural resources. Shipboard presentations on charter vessels, trade show exhibits, oil spill drill exercises, workshops are some of the ways the sanctuary reaches diverse audiences. Outreach tools include brochures, posters, videos, and a series on sanctuary research and management practices.

Location
Roughly 110 miles south of the Texas-Louisiana border

Protected Area
56-square miles

Designation
January 1992
October 1996, Stetson Bank

Address
216 W. 26th Street
Suite 104
Bryan, TX 77803

Communication
Tel: (409) 779-2705
Fax: (409) 779-2334

E-mail: flower_gardens@ ocean.nos.noaa.gov

Web Page: www.nos.noaa.gov/ocrm/nmsp/nmsflowergardenbanks.html

Gray's Reef NMS

From Whaling to Watching

Gray's Reef National Marine Sanctuary joined with other public and private organizations to improve the plight of the northern right whale, the most endangered of all the great whales. The ocean once teemed with these giant mammals; today, their populations numbers less than 300.

A new sanctuary video *From Whaling to Watching*, documents the threats facing right whales. The video, produced by Gray's Reef and Stellwagen Bank sanctuaries and the Georgia Department of Natural Resources, joins detailed graphics and maps with inspiring footage of whale behavior and informative interviews by prominent scientists and educators. The video accompanies an education handbook and poster, which together explore the life history of the world's most endangered large whale.

Sanctuary educational activities originally geared for grades six through eight is used by students of all ages, and as a teacher and media resource. It provides the only guide of its kind for a general adult audience.

Paleoenvironmental Exploration

Since Dr. Erv Garrison, Associate Professor at the University of Georgia and paleo-environmental researcher, discovered over a dozen fossils at Gray's Reef in 1996, the sanctuary has sought to learn more about its past.

Studies indicate that approximately 25,000 to 6,000 years ago Gray's Reef was a terrestrial environment as glaciers advanced and sea levels fell. Researchers believe that during the last glacial periods, Gray's Reef was an outer barrier island off Georgia's coast, populated by paleo-Indian communities and large mammals of

the Pleistocene such as mastodons and saber tooth tigers.

Sediment cores reveal high concentrations of organic material, most likely coniferous plants (probably eastern cedar or juniper), indicating the existence of a cold paleoclimate during the sanctuary's most recent terrestrial past. Similar cores point to the existence of a marsh or estuarine environment on the reef.

The evidence to date support findings that the "terrestrial" Gray's Reef exhibited a riverine region, and experienced changes from freshwater to brackish to a marine environment when humans were believed to be present on the coast.

Satellites and Sea Turtles

Gray's Reef Natural Marine Sanctuary provides an important habitat for sea turtles, including the threatened loggerhead sea turtle. The ledges and overhangs of the reef supplies the loggerhead with

International Links

Gray's Reef Manager Reed Bohne has appointments to the Marine and Coastal and the Biosphere Directorates of the U.S. Man and the Biosphere Reserve Program. In this capacity, he has chaired international biosphere reserve meetings on marine protected areas in France, Slovakia, and the Canary Islands. As a result of the 1997 meeting in the Canary Islands, Gray's Reef and the Lanzarote Marine Reserve in the Canary Islands have teamed up to develop a joint educational program about right whales and loggerhead sea turtles. The project scheduled for 1998 involves creation of a collaborative Internet web page and provisions for a live broadcast from both sites in Spanish and English for the International Year of the Ocean.

Regal Sea Fan
Photo: Passage Productions

protected resting spots, a bountiful resource of food, and close proximity to nesting sites on barrier island beaches. To study threatened loggerhead sea turtle behavior and movement in the South Atlantic Bight, the sanctuary, the U.S. Fish and Wildlife Service, and the Georgia Department of Natural Resources are using satellite transmitters to track turtle migrations. The project was designed to tag nesting turtles on Georgia's beaches and individuals offshore in the Gray's Reef sanctuary.

The project succeeded in tagging three nesting loggerhead turtles on Wassaw and Blackbeard Island National Wildlife Refuges. Signals from the transmitters tracked the three turtles as far north as Virginia and then followed their return toward Georgia waters. A map of the movements of the turtles is available on the Internet. Scientists, teachers, students and the public can follow the trail of the turtles at *www.whale.wheelock.edu/whalenet-stuff/loggerhead_cover.html.*

Stars of the Sea

Gray's Reef Sanctuary, designated for its special biological and recreational significance, depends on volunteer diving to aid in monitoring resource trends and to support management.

The sanctuary, NOAA's National Undersea Research Center, and NOAA Diving Program have teamed up to train exceptional students from regional universities for volunteer work at the sanctuary and for careers in Marine Science. An intense two-week, classroom and field training course was offered in 1997 in Savannah, Georgia, certifying students in First Aid, Oxygen delivery, Nitrox diving, and NOAA scuba diving. Additional seminars taught research methods including techniques in conducting ecological surveys and benthic inventories, as well as fish behavior and abundance censusing. These volunteer divers have been true stars of the sea for Gray's Reef.

Each contributes greatly to the sanctuary's mission of preserving and protecting precious marine environments. They are much appreciated.

Habitats

Calcareous sandstone ledges

Sand bottom communities

Tropical/temperate reef

Key Species

Northern right whale

Loggerhead sea turtle

Grouper

Black sea bass

Angelfish

Vase sponge

Ivory bush coral

Sea whips

Gray's Reef National Marine Sanctuary

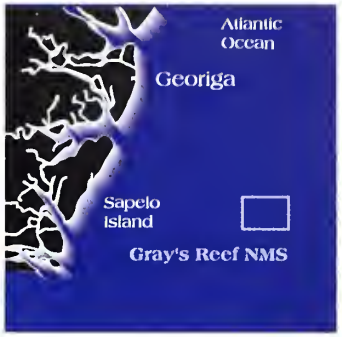
one of the largest nearshore sandstone reefs in the southeastern United States, lies just off the coast of Georgia, in waters 20 meters deep. The area earned sanctuary designation in 1981 and was recognized as an international Biosphere Reserve by UNESCO in 1986. Gray's Reef consists of sandstone outcroppings and ledges up to three meters in height, with sandy, flat-bottomed troughs between. Because of the diversity of marine life, Gray's Reef contains one of the most popular sport fishing and diving destinations along the Georgia coast.

Research Activities

Gray's Reef Sanctuary's research activities combine long-term monitoring of environmental conditions and processes and on-site projects by regional researchers. It also conducts reef fish tagging and assessment, benthic invertebrate monitoring and geoarchaeological surveys.

Education Activities

Community outreach marine programs, seminars, and presentations along with education publications and exhibits offer the community an opportunity to learn more about the vulnerable ocean ecosystems. The sanctuary's marine science curriculum instructs elementary, middle, and high school students. The Georgia Distance Learning Network conducts statewide programs.



Location
20 miles east of Sapelo Island, Georgia

Protected Area
23-square miles

Designation
January 1981

Address
10 Ocean Science Circle
Savannah, GA 31411

Communication
Tel: (912) 598-2345
Fax: (912) 598-2367

E–mail: GRNMS@ ocean.nos.noaa.gov

Web Page: www.skio peachnet. edu/noaa/ grnms.html

Gulf of the Farallones NMS

Individuals Key to Response, Restoration

In 1997 the Gulf of the Farallones National Marine Sanctuary negotiated the restoration of 500 acres of diked pasture back into wetland habitat in Tomales Bay through an interagency cooperative agreement. During the year, the sanctuary was heavily involved in response and damage assessment activities to two oil spills.

Throughout the response phase of the spills, federal and state resource trustees relied on data collected by sanctuary-trained volunteers from the BeachWatch program. The Department of Commerce recognized the contributions of Beach Watch by awarding its Environmental Hero Award to the group.

Reaching Out to the Community

The Gulf of the Farallones educated over 2,100 people through interpretive or field outings into the sanctuary. Field outings included offshore interpretive trips focusing on the open ocean, seabirds and marine mammals, kayak trips into the esteros to teach about wetland and estuarine ecology, and coastal walks promoting the sanctuary trail and the importance of stewardship and shorebird identification.

A lecture series covered topics ranging from white shark feeding ecology, cyclic occurrences of El Niño, the sanctuary's role in oil spill events, and the role of the marine sanctuaries in the community.

El Niño Hampers Seabird Restoration

Restoration of a Common Murre colony as a mitigation project resulting from the *Apex Houston* oil spill was another major sanctuary achievement. Common Murres are a species of special concern to the sanctuary, with populations in general decline due to human impacts. This project is successfully reestablishing a Common Murre colony at a site that was abandoned following the *Apex Houston* oil spill. The restoration project is a joint effort of the Department of Interior, Department of Commerce and the state of California.

El Niño has greatly impacted the restoration effects and increased the work for sanctuary staff. Heavy swells generated by bad weather prevented them from placing attractants or decoys that lure birds to breeding grounds.

International Links

Recently, Japan turned to the Gulf of the Farallones marine sanctuary for information during a recent oil spill. The sanctuary provided the Japanese Government with beach survey protocols for implementation during the country's response to the Nakhodka oil spill.

These protocols have been refined this year as the sanctuary and the Beach Watch surveyors responded to two oil spills within sanctuary boundaries. The survey protocols were requested through the U.S. Fish and Wildlife Service, who were in Japan assisting with the spill and familiar with the sanctuary's beach survey protocols.

Harbor Seals on Rocks
Photo: GFNMS Library

El Nino also affected the Common Murres feeding grounds as warm water sent their natural food farther offshore. The lack of food impacts hatching success and birthrates, and sanctuary staff expect to see far fewer chicks this year than the preceding one.

Along with Common Murres, the Gulf of the Farallones elephant seal population is expected to lose up to 75% of newborn pups because of El Niño. Food displacement and heavy storms often separate pups from their mothers during crucial nursing periods.

This year the sanctuary will be assessing El Niño's impact through monitoring local pinniped, seabird, and shorebird populations and intertidal habitats. In 1999, the sanctuary assess recovery from this punishing weather phenomena.

Stars of the Sea

The Farallones Marine Sanctuary Association (FMSA) provided invaluable support to the Gulf of the Farallones and Cordell Bank national marine sanctuaries last year. Through expanding collaborative education, interpretation, outreach, and research programs, the cooperating nonprofit association helped to protect the biological diversity and abundance just outside the Golden Gate of San Francisco.

The group's tireless dedication in promoting sanctuary goals and inspiring the residents of the San Francisco area make them an unparalleled asset and a unique vehicle of support. FMSA programs and activities increase awareness and appreciation while encouraging people to become stewards of their local sanctuaries and the world's oceans. As a shining example of care and concern for the marine environment, the Farallones Marine Sanctuary Association is a Sea Star that continues to shine.

Habitats

Coastal beaches

Rocky intertidal

Mud & tidal flats

Salt marsh

Esteros

Pelagic, open ocean

Deep benthos, continental shelf and slope

Key Species

Dungeness crab

California gray whale

Stellar sea lion

Common murre

Ashy Storm-petrel

Humpback whale

Blue whale

Rockfish & abalone

Gulf of the Farallones National Marine Sanctuary

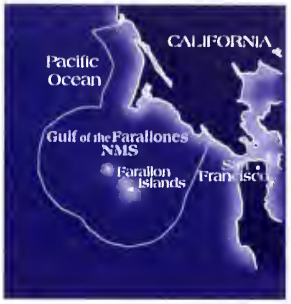
includes nurseries and spawning grounds for commercially valuable species, at least 33 species of marine mammals, and 15 species of breeding seabirds. One fifth of California's harbor seals breed within the sanctuary. The Farallon Islands are home to the largest concentration of breeding seabirds in the continental United States. The sanctuary boundaries include the coastline up to mean high tide, protecting a number of lagoons, estuaries, bays, and beaches for the public.

Research Activities

The Gulf of the Farallones Sanctuary brings monitoring and restoration, assessment, and development in a variety of research activities. Its monitoring program studies rocky intertidal habitats within the sanctuary. In the Beach Watch program, trained volunteers conduct shoreline monitoring. Sanctuary workers help to restore marshes in Bolinas Lagoon and Tomales Bay and work to reintroduce Common Murre populations to the outer coasts of the sanctuary. Development of a Geographical Information System (GIS) adds to sanctuary research endeavors. Assessments of pollutants in seabirds and Stellar sea lions and Ashy Storm-petrel population studies have been carried out.

Education Activities

Each year the Sanctuary Sea Camp holds a week-long summer camp for children. During the school year the sanctuary developed curriculum and teacher training to further marine protections. Ongoing community outreach involve seminars, presentations, and publications of marine programs.



Location
Along the coast of California north and west of San Francisco

Protected Area
1,255-square miles

Designation
January 1981

Address
Fort Mason
Building # 201
San Francisco, CA
94123

Communication
Tel: (415) 561-6622
Fax: (415) 561-6616

E-mail: gfnms @ocean.nos.noaa.gov

Web Page: www.nos.noaa.gov/nmsp/gfnms/welcome.html

Hawaiian Islands Humpback Whale NMS

From Designation to Action

Governor Benjamin Cayetano's approval of including state waters in the Hawaiian Islands Humpback Whale Sanctuary in June 1997 ensures protection of one of the world's most important humpback whale habitats while recognizing the needs and concerns of Hawaii's people. Acting as a catalyst for stewardship, the sanctuary helps state and federal agencies and local residents work together to protect whales. In becoming part of the national marine sanctuary system, Hawaii joins with the larger international community of marine protected areas.

Throughout the sanctuary designation process, NOAA listened to the voices of residents. The management plan provides for ongoing citizen input and state sovereignty over Hawaiian waters without adding new permits or user fees.

The designation provides the basis for the sanctuary to work in partnerships with the National Marine Fisheries and the state of Hawaii in preserving this important breeding and calving area of the North Pacific population of humpback whales for the benefit, of present and future generations.

A Sanctuary Built on Partnerships

Throughout the sanctuary designation process, new partner- ships have been sought with the Hawaii Sanctuary Advisory Council, state of Hawaii, local business, and environmental groups.

The 25-member Hawaii Sanctuary Advisory Council helped enormously in the formation of the final management plan for the sanctuary.

A particularly important project for the sanctuary was the establishment of a volunteer water quality monitoring program on Maui, created in

conjunction with the state Department of Health. This program, known as the *Na Pali O Ke Kai* Volunteer Coastal Monitoring project, looks at whether nutrients from discharges on land are responsible for the algae blooms that lead to seaweed accumulations on beaches. Ensuring good water quality is a first step in protecting the environment of the humpback whale and other life in Hawaii's coastal waters, and it remains a top priority of the new sanctuary.

In conjunction with the Hawaii Sea Grant Program, the sanctuary created an internship program that provides marine biology students of Native Hawaiian ancestry with opportunities to develop various skills and experiences. Interns have worked as a marine naturalist, developed a comprehensive marine management plan for the waters around Kaho'olawe, and documented the importance of the humpback whale to Native Hawaiian culture.

International Links

Several South American countries including Peru, Colombia, and Argentina are in discussions with the Hawaiian Islands National Marine Sanctuary on how sanctuaries are created and maintained. In April, manager Allen Tom interrupted his vacation in Peru to meet with students at the Collegio Roosevelt in Lima. The group discussed marine resources and steps the country could take to create a marine sanctuary in Peru for its seals and other marine creatures.

Since both Japan and the U.S. share the same humpback whale population, researchers in Tokyo and sanctuary staff are looking at ways that the two countries can learn more about whale distribution and movement within the entire North Pacific region.

Humpback whales, mother and calf

Photo: Bob Talbot

Interpretive Enforcement

Beginning in 1997, a National Marine Fisheries Service enforcement officer has been stationed at the Maui sanctuary office during the whalewatch season. The officer works with sanctuary staff to promote the interpretive enforcement of the humpback whale approach regulations. To achieve this goal, the sanctuary sponsors annual community workshops to educate citizens about these regulations and hosts a series of captain's training workshops on Maui, Kaua'i, Hawai'i, Lana'i, Moloka'i and O'ahu.

A new handbook on the federal regulations which protect marine mammals and sea turtles is available to the public. Future projects include new educational materials, including video and species identification cards.

Stars of the Sea

The Hawaiian Islands Sanctuary is committed to local stewardship of the marine environment and remains a conduit in which the community can get involved and make a difference.

In 1997 over 150 citizens logged over 2,300 volunteer hours at community events, in office renovation, and in monitoring water quality. One major volunteer accomplishment was the transformation of the Maui sanctuary office from an "off limits" abandoned ionosphere station to a public visitor center. The building and grounds now serve as a center where the sanctuary offers material on humpback whales and the marine environment. Sanctuary volunteers organized a nonprofit group AOAO O NA LOKO I'A O MAUI (Association for the fishponds of Maui) to help renovate a neighboring native Hawaiian fishpond in Kihei, Maui and establish a program to interpret this fish pond's past and present role in native Hawaiian society.

Habitats

Humpback whale breeding, calving, & nursing grounds

Coral reefs

Sandy beaches

Key Species

Humpback whale

Spinner dolphin

Hawaiian monk seal

False killer whale

Green sea turtle

Hawaiian Islands Humpback Whale Sanctuary

lies within the shallow, warm waters surrounding the main Hawaiian Islands and constitutes one of the world's most important humpback whale habitats. Scientists estimate that two-thirds of the entire North Pacific humpback whale population migrate to Hawaiian waters each winter to engage in breeding, calving, and nursing activities. The majority of humpback whales are found within 100 fathom (600 feet depth) of all the main islands. The continued protection of humpback whales and their habitat is crucial to the long-term recovery of this endangered species.

Research Activities

Hawaiian Islands Humpback whales and their habitats is the primary focus of the sanctuary. Whale population and behavior studies and a volunteer water quality monitoring project on Maui all work to preserve the marine mammals. Sanctuary staff are joined by sanctuary-supported graduate students in whale research.

Education Activities

Educational activities make up an essential part of the sanctuary operations. Classroom and shipboard presentations, educational displays, kiosks, and videos all generate community interest in marine sanctuaries. A sanctuary newsletter, brochures, pamphlets, and poster contest are other ways citizens participate in sanctuary activities.

Location
Within the 100-fathom isobath in the four-island area of Maui; Penguin Bank, and off the north shore of Kauai, the north and south shores of Oahu, and Kohola coastline off the Big Island.

Protected Area
1,370-square miles

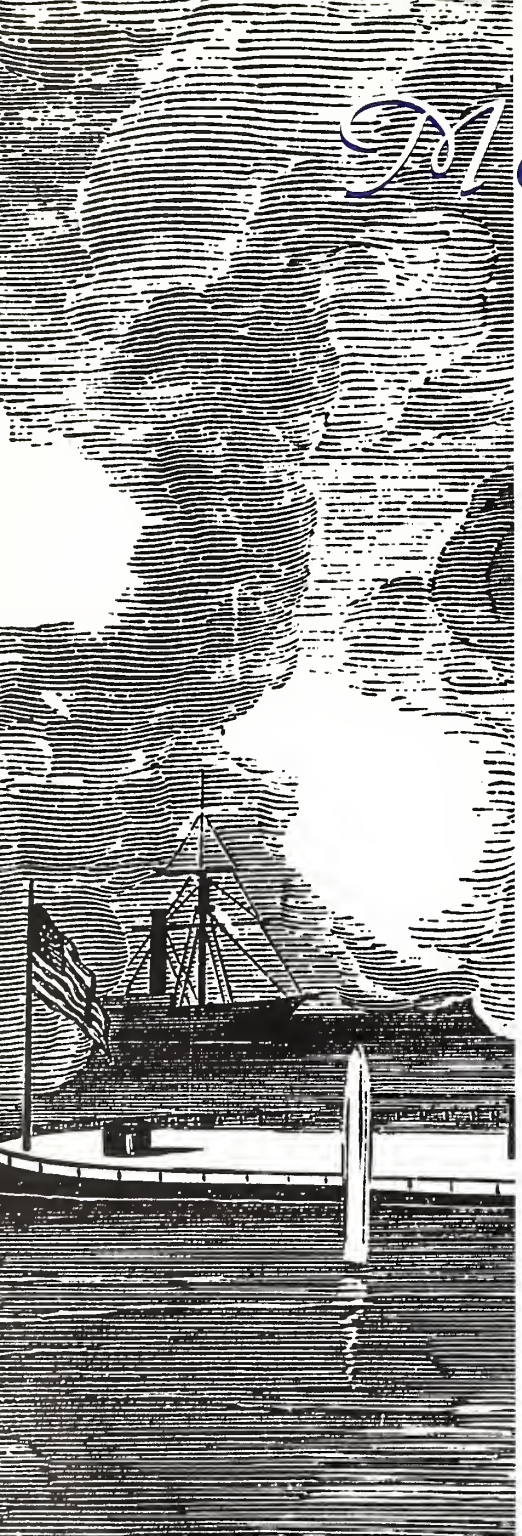
Designation
November 1992
Approved June 1997

Address
726 South Kihei Road
Kihei, HI 96753

Communication
Tel: (808) 879-2818
Fax: (808) 874-3815

E-mail: hihwnms@ocean.nos.noaa.gov

Web page: www.t-link.net/~whale/



Monitor

NMS

Monitor Preservation Plan Explored

In response to reports that the *Monitor*'s deterioration had accelerated over the past five years, the *Monitor* National Marine Sanctuary completed a draft preservation plan entitled *Charting a New Course for the* Monitor. The comprehensive preservation plan looks at long range options for management, stabilization, preservation, recovery, and conservation. It includes additional plans for the exhibition of materials and artifacts from the *Monitor* National Marine Sanctuary.

In March 1862, the Civil War ironclad USS *Monitor* survived a four-hour assault by the Confederate ironclad CSS *Virginia* at Hampton Roads, Virginia. A few months later it succumbed to a severe storm off Cape Hatteras, North Carolina.

Now the *Monitor* faces a new crisis. Photographic evidence clearly shows a marked increase in the rate of deterioration of the vessel's hull over the past five years, apparently the result of both natural and human causes. In 1993, after extensive archival and on-site research, NOAA initiated a revised planning effort to further define the extent of the problem and to identify viable options for preservation. All evidence suggests that collapse of the hull could occur at any time and that the result would be the loss of much of the ship's structure and historic contents.

The draft preservation plan recommends that the *Monitor* be preserved through a combination of stabilization and selective recovery options. Since NOAA estimates the combined costs of stabilization, recovery and conservation to be in excess of $20 million, possibly the greatest challenge will be to create a partnership of interested organizations to generate the

required funds.

The next step in planning will include detailed engineering and conservation plans as well as a funding plan.

Phase One of on-site investigation identified in the plan, "Pre-shoring Survey, Mapping, and Recovery," will be initiated during a four–week expedition to the sites scheduled for late May and June 1998. This expedition will generate information needed to formulate plans for shoring the wreck and recovering major components that may include the turret, engines, propeller, and other large artifacts.

Expedition divers will map the wreck and recover small, loose artifacts. One of the major tasks will be clearing the debris field under the *Monitor*'s stern where deck plates and structural material have collapsed in preparation for shoring the propeller shaft. Divers will survey the area prior to removing any material to locate, map, and recover small

International Links

The staff of the Monitor *National Marine Sanctuary share information with researchers in Australia, Sweden, the Netherlands, and Norway about monitor-type vessels unique to those countries as well as about recent research developments in the* Monitor *Sanctuary.*

Sweden is fortunate to have a monitor hull—the Solve*—that has been converted to carry fossil fuels. When the* Solve *was converted, the turret was placed in storage and can be remounted on the hull provided sufficient funding is obtained to restore the ship. Preservation groups in Sweden are especially interested in how plans for recovering major portions of the* Monitor *progress, as they are seeking a successful, large-scale project upon which to model restoration of the* Solve.

Battle of ironclad vessels USS Monitor and CSS Virginia
Photo: Harpers Weekly 1862

artifacts. The structural material will then be removed to an area northwest of the wreck that has also been surveyed for small artifacts.

Divers will recover small, loose artifacts that may be lost or damaged, and conservation will be carried out at the Mariners' Museum in Newport News, VA, the principal museum for the *Monitor* Sanctuary. Following conservation, the museum will exhibit the artifacts and make them available to other institutions for exhibition and interpretation.

The expedition will be carried out by a variety of archaeologists, engineers, conservators, and technical divers provided by NOAA, the US Navy, the National Undersea Research Center–University of North Carolina at Wilmington, the Cambrian Foundation, and the Mariners' Museum.

Stars of the Sea

Development of "Chartering a New Course for the Monitor" required a draft engineering and salvage plan for which no funds were allocated. Oceaneering Technologies, a division of Oceaneering International, of Upper Marlboro, Maryland, developed the draft plan at no cost to NOAA at the request of the Office of the Director of Oceaneering, Supervisor of Salvage and Diving and NOAA. The objective of the Oceaneering proposal was to provide a concept of operation for the emergency recovery, stabilization, and preservation of the Monitor. If the recommended option of selective recovery is carried out, a detailed recovery plan will be developed by the participating agencies.

Habitats

Pelagic, open ocean

Artificial reef

Key Species

Amberjack

Black sea bass

Red barbier

Scad

Corals

Sea anemones

Dolphin

Sand tiger shark

Sea urchins

Monitor National Marine Sanctuary

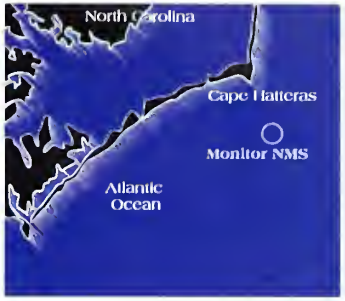
was designated the nation's first national marine sanctuary on January 30, 1975. The site was the wreck of the USS *Monitor,* a Civil War vessel that lies in 230 feet of water, off the coast of Cape Hatteras, North Carolina. The *Monitor* was the prototype for a class of U.S. Civil War ironclad, turreted warships that significantly altered both naval technology and marine architecture in the 19th century. Designed by the Swedish engineer John Ericsson, the vessel contained all of the emerging innovations that revolutionized warfare at sea. The *Monitor* was constructed in a mere 110 days.

Research Activities

In recent years NOAA has documented a dramatic increase in the rate of deterioration of the *Monitor*. Research activities will continue as NOAA seeks solutions to the current crisis. Possible solutions include stabilization of the hull and recovery of selected components of the *Monitor,* including the engines and turret. Intensive historical research into the construction of these components has been carried out, and NOAA has developed a draft preservation plan entitled *Charting a New Course for the Monitor* that identifies options for prolonging the life of the vessel. Sanctuary staff continues to provide support to private researchers through the *Monitor* Collection, which includes historical information as well as visual documentation of the wreck.

Education Activities

Because of the *Monitor*'s remote location, the majority of the American public cannot visit the site. An active education program includes posters, brochures, a paper model, an activities report, and public presentations designed to bring the *Monitor* to the public.



Location
16 miles southeast of Cape Hatteras, North Carolina

Protected Area
1-square mile

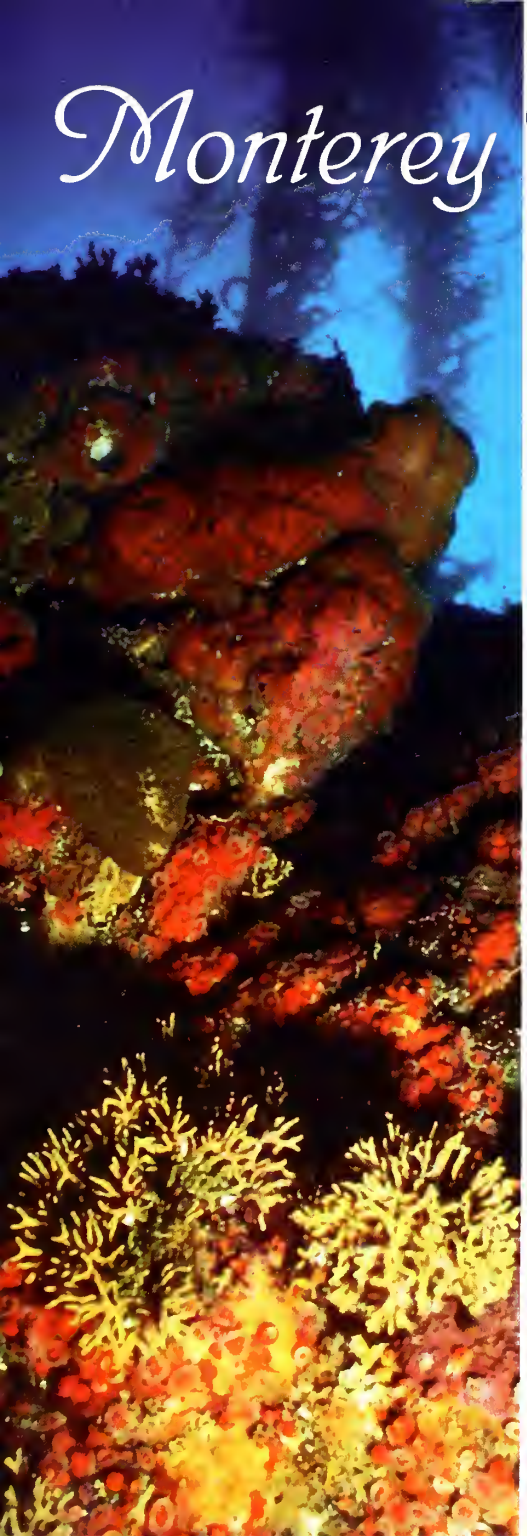
Designation
January 1975

Address
Mariners' Museum
100 Museum Drive
Newport News, VA 23606

Communication
Tel: (757) 599-3122
Fax: (757) 591-7353

E-mail: mnms@ocean.nos.noaa.gov

Web Page: www.cnu.edu/community/monitor/



Monterey Bay NMS

Expanding Protection

In 1997 an anonymous donation to the Monterey Bay National Marine Sanctuary Foundation and a cooperative enforcement agreement among NOAA and several federal and state agencies improved the sanctuary's ability to monitor its waters and protect its many resources.

The donated funds purchased patrol boats and funded state peace officers to serve as sanctuary enforcement officers. The deputized state peace officers from the California Department of Fish and Game and the California Department of Parks and Recreation will enforce federal laws and work in tandem with federal enforcement agents within the sanctuary.

Additionally, a ranger at Limekiln State Park plans to conduct sanctuary enforcement and interpretive programs along the remote Big Sur coast. Finally, the U.S. Coast Guard and Coast Guard Auxiliary has agreed to contribute to enforcement efforts by providing cooperative aerial surveillance and monitoring.

Marine Refugia

Resource managers increasingly are considering the use of no-harvest reserves, whether they are permanent or in a rotation cycle, as a resource management tool. However, little information is available on where to locate these areas, how large they should be, and for what species they are most effective.

To address these questions, scientists recently documented detailed habitat maps and current patterns at the Big Creek Ecological Reserve. Under the leadership of Dr. Mary Yoklavich of the fisheries

service, the NOAA ship *McArthur*, and coordination provided by the Monterey Bay Sanctuary, this project has become a model for interdisciplinary (fish biologists to satellite oceanographers), multi-agency (12), and protected area studies.

Building an Ocean Ethic

The Center For Marine Conservation's BAY NET program, supported by the sanctuary through education and training programs, is also known as the Monterey Bay National Marine Sanctuary Volunteer Network. BAY NET's primary goal is to enhance public awareness and understanding of the sanctuary by stationing trained docent educators at high traffic sites where there are historical, cultural, or natural resources. Trained volunteers serve as ambassadors and guides, educating the public

International Links

In the past year the Monterey Bay Sanctuary has shared information with resource managers, scientists, educators and government officials from Taiwan, the Philippines, South Korea, Spain, Japan, Jamaica, and Colombia.

Scientists from the National Chung-Hsing University visited the sanctuary in 1997. The government of Taiwan is interested in developing marine protected areas, and they came to study how the sanctuary operates. Based on the exchange of information, Dr. Pan-wen Hsueh, a member of the delegation, offered to host Monterey Bay Sanctuary staff while participating in a mini-series of public lectures on marine sanctuaries.

The sanctuary is encouraged by the growing international links between countries that promote sound management of marine resources worldwide.

Kelp Forest with Pinnacles
(Photo: Kip Evans)

about the sanctuary's resources and promoting the aesthetic wonders of this remarkable area. BAY NET guides also serve as additional sets of "eyes and ears" to help monitor natural and human activities within the sanctuary.

To date approximately 160 BAY NET volunteers interpret information for visitors along the shores of Monterey, Pacific Grove and San Simeon (at the new elephant seal colony near Hearst Castle). Since the program's debut in December 1995, BAY NET volunteers have aided over 40,000 visitors to the area.

BAY NET's goal is to build a cooperative sanctuary–wide network of organizations and individuals committed to creating a more aware, enthusiastic, and marine conservation minded public.

Stars of the Sea

Moss Landing Marine Laboratories faculty, staff and graduate students have been excellent partners in Monterey Bay Sanctuary programs, receiving the Institution Award for their efforts at the 1997 Sanctuary Currents Symposium. They have participated in many activities that benefit the Monterey Bay Sanctuary—writing an on-line sanctuary site characterization, chairing the Research Activities Panel, and contributing to an extensive written review of sanctuary fisheries. They have mapped habitats, provided office space and small boats for sanctuary staff and obtained outside funding for beach and rocky shore monitoring. They have also advised the sanctuary on kelp harvesting issues and provided resource management data on the benthic impacts of trawl fisheries, tidal erosion, and El Niño effects.

Habitats

Sandy beaches

Rocky shores

Kelp forests

Submarine canyon

Pelagic, open ocean

Wetlands

Key Species

Sea otter

Gray whale

Market squid

Brown Pelican

Rockfish

Giant kelp

Monterey Bay National Marine Sanctuary

is the nation's largest marine sanctuary, spanning over 5,300-square miles of coastal waters off central California. Within its boundaries, a rich array of habitats, from rugged rocky shores and lush kelp forests to one of the deepest underwater canyons on the west coast abound with life. These habitats attract an inviting marine world, from tiny plants to huge blue whales. With its great diversity of habitats and life, the sanctuary invites a national focus for marine research and education programs.

Research Activities

The sanctuary develops regional research priorities with 20 local marine science institutions and encourages research through numerous avenues, including funding specific projects. Research activities include monitoring coastal ecosystem change, evaluating the scientific component of resource management issues and disseminating scientific information through publications and symposia.

Education Activities

Sanctuary publications are comprised of natural history books, research and education directories, newsletters, brochures, posters, and videos. Interpretive exhibits and displays are circulated around the area. Public lectures and events, teacher training and curricula for students, internships and volunteer programs complete the range of sanctuary activities.

Location
Central California coast

Protected Area
5,328-square miles

Designation
September 1992

Address
299 Foam Street, Suite D
Monterey, CA 93940

Communication
Tel: (408) 647-4201
Fax: (408) 647-4250

E-mail: mbnms@ocean.nos.noaa.gov

Web page: www.mbms.nos.noaa.gov/

Olympic Coast NMS

Bringing Research to the Public

Olympic Coast National Marine Sanctuary celebrated its third year of field operations and the 25th anniversary of the National Marine Sanctuary program with an open house aboard the NOAA research ship *McArthur* at the conclusion of the vessel's third annual sanctuary research cruise.

The cruise supported an interdisciplinary team of wildlife biologists, geologists, fisheries scientists, oceanographers, and marine biologists who are compiling baseline data about sanctuary resources and contributing to basic research on coastal processes. Data accumulated in each of the three-years' cruises will be particularly valuable in assessing effects of this year's El Niño/ Southern Oscillation event.

Surveying History

With assistance from volunteer divers from Coastal Marine Archaeological Resources (CMAR), the sanctuary conducted subtidal and intertidal surveys on four shipwrecks. Sanctuary Archaeologist Bruce Terrell supervised the mapping of wreck fragments of the *Austria*, which grounded at Cape Alava in 1889. The *Austria* becomes accessible only during the lowest tides of the year.Olympic Coast Sanctuary staff and CMAR divers surveyed several wrecks near Cape Flattery, completing work that began with remote sensing surveys in 1995. This work helps the sanctuary satisfy its mandate under the National Historic Preservation Act to assess and inventory cultural resources within the marine sanctuary.

Adding Value, Technically Speaking

In 1997, the sanctuary distinguished itself by providing expert technical assistance in many important areas. Geographic

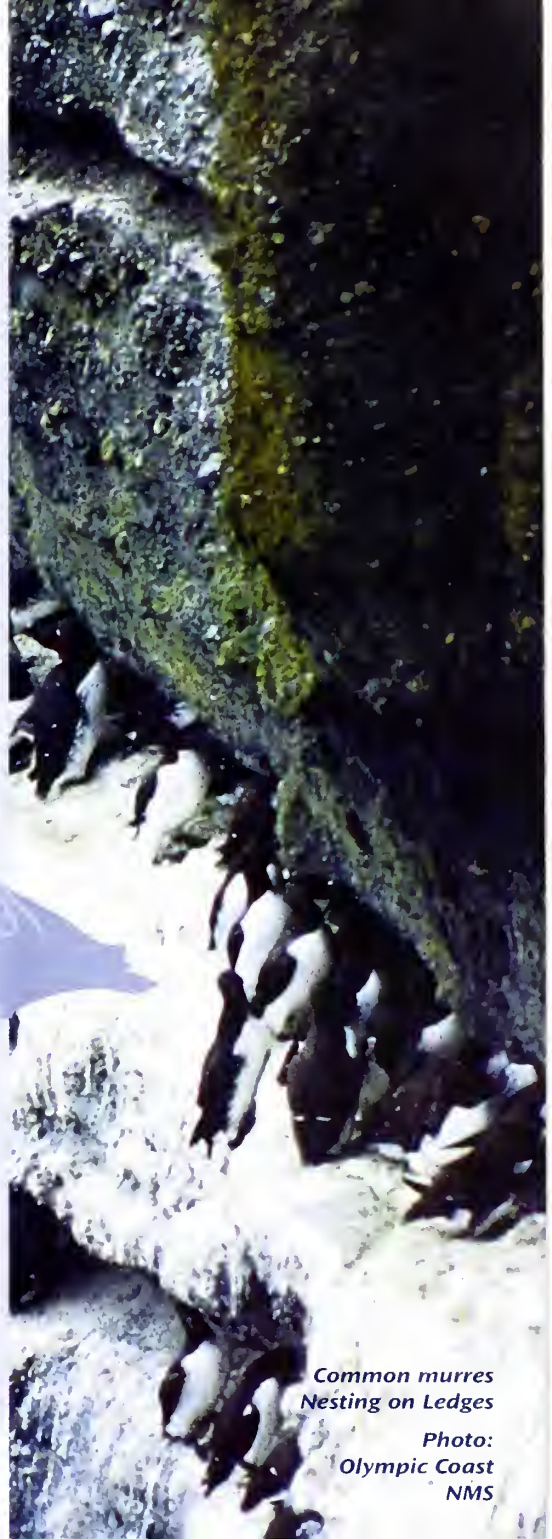
Information System (GIS) technicians and managers from over a dozen coastal resource management agencies participated in a sanctuary-sponsored workshop on GIS. NOAA GIS experts from the Coastal Services Center assisted the sanctuary in their efforts to identify opportunities for collaboration.

In partnership with National Marine Fisheries Service's National Marine Mammal Lab, the sanctuary held workshops for national and state parks rangers on marine mammal law and stranding protocols. Sanctuary Manager Todd Jacobs assisted Congressional staff in analyzing options for protecting marine resources in northern Puget Sound. Sanctuary staff also provided expert assistance to the Secretary of Transportation's study on marine transportation risks to the marine environment and helped train Olympic National Park and Washington State Parks naturalists on marine resource interpretation.

International Links

North of Olympic Coast National Marine Sanctuary, the waters of Canada and the rugged wilderness coast of Canada's Pacific Rim National Park meet. Threats to the sea know no boundaries and protecting a coastal ecosystem in two countries requires close cooperation between the nations and their respective agencies.

In order to understand marine transportation and minimize its risks within the sanctuary, Olympic Coast staff teamed up with Canadian Coast Guard vessel traffic specialists at Tofino, British Columbia. At Tofino, ships traversing the Strait of Juan de Fuca are monitored on radar much like air traffic. That information is relayed to the sanctuary where it is plotted on a Geographic Information System (GIS). With the GIS, sanctuary staff can understand vessel traffic in the context of critical ecological resources and assess compliance to the International Maritime Organization's Area-To-Be-Avoided on the Olympic Coast.



Common murres Nesting on Ledges

Photo: Olympic Coast NMS

Olympic Coast Sanctuary also promoted research with funding, in-kind support, or staff assistance to other federal and state agencies, tribal staff, and academic institutions. Research projects included monitoring sea otter populations, surveying subtidal and intertidal habitats, at-sea seabird surveys, and biotoxin sampling.

Blending Research, Education and Management

In an effective blending of research, education, and resource protection, the sanctuary developed campaigns to improve regulation compliance with aircraft overflights and International Maritime Organization's Areas To Be Avoided.

Student interns in both aircraft and ATBA projects conducted extensive literature reviews and interviews with significant user groups: pilots, boat captains, and navigators. Partnerships built on these efforts ensure that well-informed user groups play contributing roles in protecting the sanctuary's resources.

Stars of the Sea

How do animal populations endure when survival means literally "living on the edge," and predators are always nearby? For Dr. Julia Parrish, a University of Washington seabird researcher, the answers are found on Tatoosh Island, in Olympic Coast National Marine Sanctuary.

Dr. Parrish studies Common murres, a seabird generally abundant on the west coast but very vulnerable to oil spills. In Washington state, nesting colonies of murres have declined in the last ten years. Murres lay only one egg, usually on a bare rock ledge just above crashing waves. Murres are regularly taken by bald eagles, often bold enough to enter a colony and seize them.

"These birds have the highest nesting density of any seabird, and they pick the worst places to nest," she said. "Its a wonder any of them survive." For Dr. Parrish, murres and other seabirds are crucial indicators of highly dynamic conditions in ocean ecosystems. "These birds do a lot of 'sampling' for us, the health of their population tells us whether or not the ocean is healthy." Dr. Parrish serves on Olympic Coast Sanctuary Advisory Council and is currently helping develop a volunteer seabird monitoring program with the Sanctuary.

Habitats

Rocky & sandy intertidal

Kelp forests

Seastacks & islands

Pelagic, open ocean

Submarine canyons

Key Species

Tufted Puffin

Bald Eagle

Northern sea otter

California gray whale

Humpback whale

Pacific salmon

Common murre

Olympic Coast National Marine Sanctuary

spans 3,310-square miles of marine waters off the rugged Olympic Peninsula coastline. The sanctuary extends about 35 miles seaward, covering much of the continental shelf and several major submarine canyons. The sanctuary protects a productive upwelling zone—home to rich marine mammal and seabird faunas, diverse populations of kelp and intertidal algae, and thriving invertebrate communities. The sanctuary is also rich in cultural resources, with over 150 documented historical shipwrecks and the vibrant contemporary cultures of Makah, Quinault, Hoh, and Quileute Native American tribes.

Research Activities

The sanctuary conducts an active program of physical oceanographic, geologic, marine archaeological, and biological research. Sanctuary partnerships join federal, tribal, and state agencies, as well as universities and private research organizations in coordinated marine research.

Education Activities

The sanctuary teams with the National Park Service and Washington State Parks to serve visitors with on-site interpretive programs. The sanctuary also assists the Makah, Quileute, Hoh, and Quinault tribes in developing nature-based tourism opportunities for economic development in reservation communities. The sanctuary helps local school districts develop marine science programs based on field investigations and intertidal monitoring. Publications, a website, and other products promote sanctuary goals.

Location
From Cape Flattery to the mouth of the Copalis River, on Washington's outer coast

Protected Area
3,310-square miles

Designation
July 1994

Address
138 West First Street
Port Angeles, WA 98362

Communication
Tel: (360) 457-6622
Fax: (360) 457-8496

E-mail:ocnms@ocean.nos.noaa.gov

Web Page: www.nos.noaa.gov/nmsp/nms olympiccoast .html

Stellwagen Bank NMS

Traveling Photo Exhibit

In late 1996 the sanctuary created a photo exhibit called "Creatures of the Bank: An exploration into the biodiversity of the Gerry E. Studds Stellwagen Bank National Marine Sanctuary." The exhibition opened on Capitol Hill in honor of retiring Congressman Gerry Studds, for whom the sanctuary was renamed, and provides both general and technical information in an informal setting through the use of exciting underwater and surface photographs.

Throughout 1997, the photo display was one of the sanctuary's most well-received public outreach efforts. Now consisting of two complete shows (and one partial version), the exhibit was made possible by the generous donation of images from numerous commercial and amateur photographers. With images ranging from microscopic diatoms to 75-foot finback whales, the exhibition illustrates the wealth of marine resources and the complexity of the food web at Stellwagen Bank.

The exhibit changes as new photographers add their images to the collection, and the sanctuary is exploring possibilities for future exhibitions as well as the development of a corporate sponsorship arrangement.

The sanctuary thanks the many talented photographers who contributed to the exhibit: Peter Auster, NURP-UConn; Jonathan Bird, Oceanic Research Group; Norman Despres; Jeff Hannigan; Dr. Richard Harbison, WHOI; Dr. Paul Hargraves, URI; Andrew Martinez; Kevin McCarthy; Bob Michelson, Photography by Michelson; David and Susan Millhouser; and Dr. Jon Witman, Brown University.

Right Whale Conservation and Education

Northern right whales are the most endangered of the world's great whales, and many of the North

Atlantic population spend some time in the sanctuary and nearby Cape Cod Bay. Their proximity as well as the critical status of the species led the sanctuary to take a leadership role in conservation and education programs.

Through the Northeast Implementation Team, the sanctuary helped coordinate a regional effort to address ship strikes, the leading cause of human-induced mortalities to the whale. This multifaceted program consists of several actions including lending support to the development and implementation of an Early Warning System for the Northeast. It also works with the International Fund for Animal Welfare, the New England Aquarium, the National Marine Fisheries Service, and others to ensure that charts and U.S. Coast Pilot (documents available to mariners) provide better information on the right whale-ship strike problem. The sanctuary actively participates in the Atlantic Large

International Links

The Stellwagen Bank National Marine Sanctuary, located at the mouth of Massachusetts Bay, serves as a regional resource for the entire Gulf of Maine, which encompasses Georges Bank to the southeast and the Bay of Fundy to the north. The gulf touches upon the shores of three states as well as two Canadian provinces. As caretakers for one of the largest Marine Protected Areas (MPAs) within the Gulf of Maine, the sanctuary staff has taken a lead role within the Gulf of Maine Council on the Marine Environment in efforts to establish an integrated network of MPAs around the gulf. This expertise has been sought by Canadian counterparts in environmental agencies who are charged with developing an MPA program as provided in the Canadian Oceans Act of 1997.

The sanctuary's cooperation with Canada this past year has also extended into co-sponsorship of a special workshop on impacts of fishing gear on the seafloor at the annual meeting of Conservation Biology, held in Victoria, British Columbia.

Sand Dollars
Photo: Andrew J. Martinez

Whale Take Reduction Team to address the issue of fishing gear entanglement on a coast-wide scale.

High-Resolution Mapping Project

In 1997 the field mapping phase of a multi-year high resolution mapping project was successfully concluded. The sanctuary now has over 2000–square nautical miles of ocean bottom mapped in detail, unparalleled anywhere in the ocean realm, thanks to our partnership with the US Geological Survey. In addition to traditional topographic maps, the scientists are working on the release of the data in digital form to allow users to achieve the highest resolutions.

This information is helping biologists characterize fish assemblages in the sanctuary. Other researchers are now using the data for a variety of \similar scientific applications that look at productivity within the benthic community.

Stars of the Sea

Over the past four years, Page Valentine of the U.S. Geological Survey (USGS) has worked with the sanctuary to undertake a high resolution mapping project. With great personal resolves, he has been able to secure considerable funding from USGS to make the project happen and has been to sea on more cruises than he would like to remember. With a cadre of USGS scientists and technicians, he has taken countless grab samples and videos of the seabed. Page has devoted himself to providing the best maps that sanctuary technology can produce by worked closely with the Captain and crew of the Canadian Hydrographic Service's Frederick G. Creed to collect the high-resolution bathymetric and side-scan sonar data that form the basis for the maps. He has filled his office with stacks and rolls of sanctuary maps. The Stellwagen Bank National Marine Sanctuary is fortunate to have such an extraordinary person to help make the mapping project a reality.

Gerry E Studds

Stellwagen Bank National Marine Sanctuary

sits at the mouth of Massachusetts Bay between Cape Ann and Cape Cod. The 824-square mile sanctuary encompasses mud-filled basins, rock ledges and boulder fields and the gravel and coarse sand bank which was formed by the retreat of glaciers from the last Ice Age. The bank's position at the mouth of Massachusetts Bay forces an upwelling of nutrient-rich water from the Gulf of Maine—leading to high productivity and a multilayered food web with species ranging from single-celled phytoplankton to the great whales.

Research Activities

Sanctuary projects include a side-scan sonar survey, a geological characterization with the US Geological Survey, and a fishery habitat research program. The Aquanaut Program of the National Undersea Research Center at University of Connecticut uses the sanctuary as a site for student research on benthic communities and acoustics.

Education Activities

The sanctuary serves as a whale migration resource center for *Journey North*, an Internet-based education program and offers a comprehensive Stellwagen Bank Information Center with the U.S. Geological Survey at *vineyard.er.usgs.gov*. Sanctuary educational activities include an annual week-long MimiFest for grades 4-8, curriculum design, and professional development workshops. The sanctuary also maintains interpretive kiosks, a traveling photo exhibit, sanctuary videos, and a new CD-ROM on the food web.

Habitats

Sand & gravel bank

Muddy basins

Boulder fields

Rocky ledges

Open ocean

Key Species

Northern right whale

Humpback whale

Atlantic White-sided dolphin

Wilson's Storm Petrel

Northern Gannet

Atlantic Bluefin tuna

Atlantic cod

Winter flounder

Sea scallop

Northern lobster

Sand lance

Location
25 miles east of Boston, 3 miles southeast of Cape Ann, and 3 miles north of Provincetown

Protected Area
842-square miles

Designation
November 1992

Address
14 Union Street
Plymouth, MA 02360

Communication
Tel: (508) 747-1691
Fax: (508) 747-1949

E-mail: sbnms @ocean.nos. noaa.gov

Web page: vineyard.er. usgs.gov/

photo: Bob Talbot

Sea Smart

Famed ocean explorer Jacques Cousteau once reminded the world that "Our future depends upon the care and the love with which we manage our only water supply—the oceans." This message—that we all must be more mindful of this precious natural resource—has taken root in the NOAA's National Marine Sanctuaries program, whose vision, mission and goals foster an ocean ethic of care and action. This mission to "ensure healthy marine and coastal ecosystems, including natural and cultural resources, by providing innovative management of a network of nationally significant areas through protection, conservation, restoration, and compatible use" benefits not only this generation, but generations to come. It recognizes that sanctuaries belong to all of us and that with this gift comes with a responsibility that we can meet.

Saving the oceans take many hands, and the sanctuary program continues to widen its circle of partnerships. We've found good friends and fellow marine advocates in federal and state agencies, nonprofit associations, and foundations and received welcome assistance from a great number of individuals from schoolchildren to senior citizens.

Our "Sea Smart" campaign, in the concluding pages, introduces only a few of the many groups who share our ocean ethic and find ways to promote ocean stewardship. We salute the industries and nonprofit organizations for taking leading roles in promoting clean marine environments: the Surfrider Foundation, Diving Equipment & Marketing Association, National Science Teachers Association, Center for Marine Conservation, Defenders of Wildlife, and the Atlantic States Marine Fisheries Commission.

The past year provided the National Marine Sanctuaries Program with many opportunities to promote a greater understanding of the ocean and the creatures that inhabit it. The stories from the 12 national marine sanctuaries attest to this.

In learning the language of the ocean, the sanctuaries also listened to the voices of the people whose lives are tied to our ocean resources, from those who depend on them for their livelihoods to those who come to visit and enjoy.

The year ahead provides an even greater opportunity for the National Marine Sanctuaries program to share what we have learned and to search for more discoveries that bring us closer to Aldo Leopold's harmony between humankind and the oceans we share. We invite you to join us.

photo: Bob Talbot

As an Environmentally Responsible Diver...

I dive within the limits of my ability and training.

I am careful about what I touch underwater.

I do not break plants or coral or collect "souvenirs."

I respect environmental laws and game limits.

I collect and dispose of trash I find while diving.

I let dive buddies, resorts, and dive operators know how I feel about environmental responsibility.

I never dive in a manner that would hurt the environment.

I use mooring buoys whenever available or anchor in areas free of live bottoms.

I am considerate of ocean wildlife.

Text Courtesy of:

NATIONAL MARINE SANCTUARIES

Divers have the wonderful privilege of visiting a world that our landlocked brothers and sisters will never see first hand. To explore the beautiful, and often mysterious, underwater world is like no other experience on earth. But with this privilege comes the responsibility to keep this unique environment as nature made it...undamaged by human activity.

Responsible divers are environmentally conscious on every dive. This means they are careful about what they touch, and they do not break plants or coral to collect "souvenirs." A responsible diver respects the game laws pertaining to size and bag limits and sets a good example of environmental responsibility by collecting and properly disposing of trash found during a dive.

The aquatic world is something all divers share, and being a responsible diver means you let your dive buddies, resort, and dive operators know how you feel about the environmental responsibility. Remember, your actions speak louder than words.

Text Courtesy of:

DIVING EQUIPMENT & MARKETING ASSN
DEMA

NATIONAL MARINE SANCTUARIES

All of us can learn some of the ways to help protect fish habitat in our travels on board and on shore. Each person's small efforts add up to a big difference for fish habitat.

When underway...

- Keep trash from blowing overboard; bring it back to port for proper disposal.
- Avoid boating in shallow waters, especially those with submerged vegetation.
- Follow "no wake" postings, and keep wakes down in shallow or nearshore areas to prevent erosion and protect wildlife.
- Never discharge treated or untreated sewage; wait to use pump out facilities.
- Report oil spills or debris violations to the proper authorities.

At the dock...

- Recycle used oil and filters, batteries and antifreeze.
- Tell your friends and fellow fishermen about the importance of protecting fish habitat.
- Minimize fish waste disposal in marina waters.
- Encourage your marina to provide facilities for recycling and dry dock repair.
- Whenever possible, do repairs and painting in dry dock; keep paints and paint chips away from the water. When sanding or scraping, use tarps to catch pollutants.

On your boat...

- Use oil absorbent materials in your bilge and for spill cleanup.
- Refrain from using detergents and bilge cleaners; never pump them overboard.
- Use the smallest amount of the least toxic products available when cleaning.
- Be careful when fueling; catch any overflow with petroleum absorbent materials, and install an overflow alarm on your fuel tank.

Text Courtesy of: Atlantic States Marine Fisheries Commission

National Marine Sanctuaries

Anyone who's spent time on the water can appreciate the beauty and richness of our bays and oceans. As more people are being drawn to the water—by the year 2010, more than 53% of the people in the U.S. are expected to live within 50 miles of the coast—threats to our waters will increase. Even improper boating related activities can contribute greatly to the degradation or loss of important coastal resources.

Estuaries and near-shore waters are vital breeding grounds of important fish and shellfish. Unfortunately, these areas are also frequently exposed to pollution from vessel activities that can be prevented. Even when diluted, pollutants can have harmful impacts to fish and shellfish.
For example:

- Only one quart of engine oil spilled in one million quarts of seawater can kill half of the exposed crab larvae.
- When vessels are fueled, up to 8 ounces of fuel can spill into the water. Although some of the gas and diesel fuel evaporate rapidly, many toxic compounds remain behind in the water column.
- Discharged untreated sewage and bacterial contamination severely impacts the ability to harvest shellfish such as clams and oysters.
- Sanding toxic hull paint over the water, littering, and emptying cleaners, paints or solvents into drains or directly into the water also adds pollutants to our waters.

Multiply these relatively small spills by the number of boats in a busy marina and the number of boating days per year and it contributes to water quality problems. Pollutants reduce the amount of oxygen in the water, impair the functioning of fish gills, reduce the ability of seabirds to stay warm and dry, and can be unhealthy to both wildlife and humans.

Whether fishing or boating for sport or work, fishermen and boaters are especially in tune with the benefits of clean and bountiful marine waters and can be first in protecting them.

Text Courtesy of: Atlantic States Marine Fisheries Commission

National Marine Sanctuaries

The Wildlife Watcher's Code

Keep your distance — use binoculars, spotting scopes and zoom lenses to get close to wildlife.

Stay on trails to protect habitat, and be careful not to damage or trample plant life.

Don't use calls, whistles or other artificial means to attract wildlife.

Don't touch any animal even if it appears to be sick, injured or orphaned.

Leave pets at home — they may startle, chase and even kill wildlife.

Please don't feed wildlife!

Move away slowly and immediately if an animal stops feeding and raises its head sharply, appears nervous or aggressive, changes its direction of travel, exhibits a broken wing display or circles repeatedly.

Respect the rights of other wildlife viewers; move slowly and quietly.

Respect the rights of landowners — get permission before entering private property.

Share the joy of wildlife viewing with others, especially children, and teach them about the importance of not disturbing animals.

Text Courtesy of:

Observing wildlife "in the wild" is one of life's great pleasures, but as with most thrilling pursuits there are basics to learn and rules to follow.

If you don't learn the basics, such as how to use binoculars, what to look for where and when, you're not likely to see much. If you don't follow the rules — guidelines on how to behave so as not to disrupt wildlife, you can cause serious problems for the very wildlife you're interested in viewing.

Wildlife biologists have observed many incidences of wildlife harmed or disturbed by people, often unintentionally: harbor seal pups and seabird chicks abandoned by their parents after frequent close approaches by boats to the offshore islands where they live; coral reefs irreparably damaged by the cumulative effects of grounded boats, dropped anchors, and inexperienced swimmers and divers touching or breaking off pieces; dolphins and manatees hit by inattentive boaters; colonies of beach-nesting shore birds decimated by uncontrolled pets; sea turtles, birds, dolphins and other animals injured or sickened by encountering or ingesting human food, fishing hooks, nets, garbage, and other human detritus.

The goal and thrill of watching wildlife is to observe without disrupting. When you watch without causing a reaction, you are seeing what's truly wild. Learn the basics, follow the rules (The Wildlife Watcher's code opposite), and, with all due respect, immerse yourself into the world of nature.

Text Courtesy of: DEFENDERS OF WILDLIFE®

NATIONAL MARINE SANCTUARIES

When students in Topeka, Kansas ask why they should know about oceans they may never see, or wonder how an ocean half a world away may affect them, teachers need a ready answer that jump-starts the learning process.

70 percent of the Earth's surface is covered by saltwater.

More than half of the population of the United States lives and works within 100 kilometers of an ocean or Great Lake.

Oceans serve as crucial global highways, transporting cargo to and from world markets

The ocean floor contains some of the world's most important mineral, gas, and oil deposits.

One-fifth of the animal protein consumed by the world's population comes from the sea.

Fish and other marine organisms hold the key to many life saving drugs and vital medical treatments.

Earth's weather, from the expected to the exceptional, is generated by the ocean.

El Niño, a climate event produced by changes in ocean temperature, has influenced the price of fruits, vegetables, and grains all over the world.

Text Courtesy of:

NSTA National Science Teachers Association

NATIONAL MARINE SANCTUARIES ™

To understand weather, to heat our homes, to eat, and to discover new cures, we must continue to protect and study Earth's oceans. Oceans can be tools for teaching math, chemistry, biology, physics, and even history, business, and economics. As students see how the ocean plays a role in their everyday life, they will become stewards of this finite resource, and discoverers of ways to become more sustainable users.

The following list of teacher's conventions and resources can turn your classroom into a research vessel with links to teacher conventions, oceanic data, curricula, exercises, laboratories, and ongoing sea explorations.

NASA SeaWIFS Project: Ocean Color from Space .....(301) 286-9428
http://seawifs.gsfc.nasa.gov/SEAWIFS.html

Smithsonian Ocean Planet Exhibition.....(301) 286-9428
http://seawifs.gsfc.nasa.gov/ocean_planet.html

The JASON Project *Expedition IX: Oceans of Earth and Beyond* .....(781) 487-9995
www.jasonproject.org

Jet Propulsion Laboratory: Physical Oceanography Data(818) 354-9890
http://podaac.jpl.nasa.gov

The Marine Science Institute Workshop.....(650) 364-2760
www.sfbaymsi.org/teach.htm

Bigelow Laboratory for Ocean Sciences – Gaia Project.....(207) 633-9600
www.bigelow.org

Introduction to Atmospheric and Oceanographic Data.....(303) 497-1361
www.cgd.ucar.edu:80/cas/tn404

International Oceanographic Foundation.....(305) 361-4888
www.rsmas.miami.edu/iof

National Oceanographic Data Center .....(301) 713-3277
www.nodc.noaa.gov

NSTA Water Education Publications.....(800) 722-6782
www.nsta.org/pubs/

1998 International Year of the Ocean.....(888)4YOTO98
www.yoto.com

For links to additional resources, visit www.seaweb.org

Text Courtesy of:

NSTA National Science Teachers Association

NATIONAL MARINE SANCTUARIES

Never swim or surf until 72 hours after a heavy rain. In urban areas and agricultural areas, the runoff may contain dangerous pollution.

Always wear sun screen.

Walk, skateboard, ride a bike or car pool to the beach. Automobile emissions cause pollution.

When walking to and from the water, try to pick up at least one piece of trash and drop it in a trash can. Every little bit helps, plus you set a good example for others who may be watching.

Keep a coffee mug in your car, so when you stop to get coffee on the way to the beach, you use your own mug instead of using styrofoam containers — it saves resources and prevents litter.

The beach is not a big ashtray — hold onto your cigarette butts until you can dispose of them properly.

Leave only footprints. Pack out what you pack in.

Obey the lifeguard. Lifeguards not only protect your safety but the safety of the animals and marine life that lives at the beach.

Don't drive on the beach. The beach is an important ecosystem and not a parking lot or race track.

Get involved! Join an ocean conservation volunteer group. You can make a difference.

Text Courtesy of: Surfrider Foundation.

NATIONAL MARINE SANCTUARIES ™

Use it — don't abuse it. Everyone who uses the coasts and oceans has the responsibility to play smart. Not only do humans depend on these areas, but so do fish, whales, dolphins, seals, turtles, birds and creatures as small as seastars and plankton. Since we use the beaches, we have a responsibility to keep them clean and healthy. Your individual actions can make a difference. Get into it!

Text Courtesty of: Surfrider Foundation.

NATIONAL MARINE SANCTUARIES ™

To become a good steward of our marine planet, please:

Conserve Water.
Conserving the amount of water you use at home prevents coastal water pollution.

Maintain Septic Systems.
Monitor your tank yearly. Have a reputable contractor remove sludge every three to five years to prevent solids from escaping the absorption system and reaching our coasts.

Curb Your Pets.
Pick-up and properly dispose your pet wastes. This reduces dangerous fecal coliform bacteria in polluted stormwater runoff.

Practice Proper Lawn and Home Care.
Use natural fertilizers and compost on your garden and minimize the use of pesticides and herbicides. Keep trees if possible and use porous paving materials or gravel that allows water to soak into the ground.

Practice Proper Boating-Waste Disposal.
Discharged boating wastes discharged can be a significant cause of high fecal coliform concentrations. Dispose of your boat sewage in onshore sanitary and pumpout facilities. Don't dump sewage or trash overboard.

Learn About the Water Quality at Local Beaches.
Contact local health officials and ask them about the sources of pollution affecting beaches, if they regularly monitor water quality and the results of any monitoring.

Participate in a local pollution cleanup effort.

Text Courtesy of:
CENTER FOR MARINE CONSERVATION

NATIONAL MARINE SANCTUARIES ™

More than 30 years ago, in her celebrated book *Silent Spring*, Rachel Carson warned of the possibility of empty skies — skies devoid of bird calls and songs, of flashing wings and brightly turned feathers. Her disturbing vision roused the public and led to a nationwide ban on DDT.

Today the public must be awakened to another looming environmental catastrophe: empty seas. Although our supermarkets' seafood sections may be brimming, our oceans are not. The truth of what humankind is doing to our waters is less easy to confront: we are depleting entire fisheries; poisoning the world's waters beyond their capacity to heal themselves, and using up — in many cases, wasting — our extraordinary inheritance of marine life and our waters.

As part of the problem, we are all part of the solution. The maintenance of healthy seas and abundant marine life requires all our help. Together we can ensure the future of marine species and the human species by living smart.

Text Courtesy of: CENTER FOR MARINE CONSERVATION

NATIONAL MARINE SANCTUARIES ™

Sanctuary Sites

NATIONAL MARINE SANCTUARIES

Keeping in Touch

National Marine Sanctuaries
1305 East-West Highway
Silver Spring, MD 20910
(301) 713-3125

Channel Islands NMS
113 Harbor Way
Santa Barbara, CA 93109
(805) 966-7107

Cordell Bank NMS
Fort Mason, Building #201
San Francisco, CA 94123
(415) 561-6622

Fagatele Bay NMS
P.O. Box 4318
Pago Pago, AS 96799
011-684-633-7354

Florida Keys NMS
(Administration)
P.O. Box 500368
Marathon, FL 33050
(305) 743-2437

Florida Keys NMS
(Lower Region)
216 Ann Street
Key West, FL 33040
(305) 292-0311

Florida Keys NMS
(Upper Region)
P.O. Box 1083
Key Largo, FL 33037
(305) 852-7717

Flower Garden Banks NMS
216 W. 26th Street
Suite 104
Bryan, TX 77803
(409) 779-2705

Gray's Reef NMS
10 Ocean Science Circle
Savannah, GA 31411
(912) 598-2345

Gulf of the Farallones NMS
Fort Mason, Building 201
San Francisco, CA94123
(415) 561-6622

Hawaiian Islands Humpback Whale NMS
726 South Kihei Road
Kihei, HI 96753
(808) 879-2818

Monitor NMS
The Mariners' Museum
100 Museum Drive
Newport News, VA
23606-3759
(757) 599-3122

Monterey Bay NMS
299 Foam Street, Suite D
Monterey, CA 93940
(408) 647-4201

Olympic Coast NMS
138 W. First Street
Port Angeles, WA 98362
(360) 457-6622

Stellwagen Bank NMS
14 Union Street
Plymouth, MA 02360
(508) 747-1691

Proposed Sanctuaries

Thunder Bay NMS
2205 Commonwealth Blvd.
Ann Arbor, MI 48105
(313) 741-2270

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